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We desire to thank our many customers for making this passing year the largest in our history.

We wish you and yours a most Happy and Prosperous New Year.

The Sprague Meter Company
Bridgeport, Conn.

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ROOTS

Installation of Roots Low Pressure Blower used to furnish air to Water Gas Sets at Plant of Public Service Gas Co., Paterson, N. J.

Save 25% of the Steam by Installing a ROOTS Blower for Your Water Gas Sets

A high quality Turbo Blower requires 400 H. P. to deliver 40,000 cubic feet of air per minute at 42" W. G. The Roots Rotary Positive Blower requires but 300 H. P. to deliver the same volume of air at the same pressure.

Increase the Make of Your Set 30%

In addition to the great power saving, better operating conditions are noted. It is natural to expect this because the necessary volume of air is forced through the fire regardless of clinkers. At one plant in which a Roots Blower replaced a fan, the superintendent estimated an increase in make of thirty per cent. An increase in make of gas can be expected, especially where an old-style fan is replaced by a Roots Blower.
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The P. H. & F. M. ROOTS CO.

CHICAGO
Peoples Gas Building

CONNERSVILLE, INDIANA

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NEW YORK
120 Liberty Street

AMERICAN
GAS JOURNAL

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Control In Industrial Gas Business

British gas companies keep tight hand on trade in apparatus

A. J. Smith

(The following article contains matter of interest to the gas man and the gas company concerned with industrial use of gaseous fuel. The conditions described therein apply, it will be understood, to the British gas industry, but there is matter for thought in it for the American gas company who may have had to contend with similar problems. The use of apparatus in industrial plants, burning gaseous fuel, and not properly designed for the purpose, is a matter of moment to every gas company that wants to develop its industrial business.—Edit.)

THE American gas manager who surveys the British gas industry would say that most of the gas companies had not sold their market by reason of the lack of attention to the industrial business which is apparent in most areas. Although the domestic cooking and heating field has been well catered to for these many years, and although it is quite the general rule for some of the smallest undertakings to have show-rooms (frequently the best-designed store in the town) for the purpose of demonstrating the use of all domestic apparatus such as heaters, ranges, hot plates, gas-fired steam radiators, and similar goods, which, on the whole, present no very considerable technical difficulties in their application, yet the vast field which many manufacturing towns offer for the industrial employment of gas fuel has been left to take care of itself by most undertakings.

In this, however, there are certain noteworthy exceptions, and the progressive American gas man would feel more in his element in studying the methods of such undertakings as the South Metropolitan and the Gas Light and Coke Company in London, and in the provinces those of Birmingham, Sheffield, Glasgow, Manchester, Leeds, or Halifax, where the industrial demand has received great attention, and where as much forethought is devoted to selling gas as to any other commodity. Industrial development is aided in all these cities by the provision of demonstration rooms fully equipped with the latest appliances for the melting of metals and for the various metallurgical heat-treatment operations, with particular reference to the staple industries of the district.

Cost of Demonstrating Industrial Equipment

The cost of installing a demonstration equipment is not always bound to be a particularly serious item as so many manufacturers of furnaces find it to their advantage to supply certain of their apparatus either free of charge or at any rate upon very favorable terms, as the inclusion of any apparatus in a gas company's demonstration room carries with it the cachet of the local undertaking's approval. Moreover, it is an advertisement of no trifling order for such apparatus to be well installed in a situation where it is bound to come before the notice of every progressive manufacturer in the neighborhood who may be seeking information upon the most scientific method of heating.

However, practice in this respect varies considerably in Britain, probably in accordance with the amount of the appropriation which the enlightened gas manager has been able to wheedle from his directors for the purpose of developing the industrial field. For instance, in the case of the cities previously mentioned, we find one undertaking purchasing all the furnaces for its demonstration room at current list prices, while another purchases its requirements in this line from the same makers, but less a special allowance of 50 per cent in consideration of the advertisement which is afforded by the apparatus being for exhibition.

Another undertaking, either with more money available or with less knowledge of this particular branch of the business, will obtain its demonstration equipment with a 15 per cent allowance only in consideration of its being exhibited; but it is now becoming more and more the rule for all such apparatus to be supplied free of charge by the makers,

who at the same time are usually quite willing and even anxious to send up mechanics free of charge to start the furnace and thoroughly instruct the attendants in the correct handling of the apparatus. As a set-off, it is usual for the gas undertaking to grant the makers of such apparatus permission to bring their prospects from other districts into this test room to inspect the furnaces under working conditions on payment of the actual cost of the gas used, the power and the attendant's time in connection with the demonstration.

Equipment Maker and Gas Co. Must Work Together

It is quickly found that the inauguration of an industrial heating department, the provision of a demonstration room, and the hiring of experts is not the end of the business. The best results cannot be obtained by the gas company and apparatus makers working independently, otherwise the awkward situation frequently arises of makers quoting and installing apparatus for purposes which the gas company had decided their fuel was not suitable. In this connection, it must not be overlooked that it is the gas company rather than the furnace maker who has the best interests of the consumer at heart, for though they are both interested in selling and installing more and more gas apparatus, they occasionally look at a proposition from a somewhat different angle.

A furnace maker (let it be whispered only!) may sometimes supply for a certain duty gas apparatus which is not absolutely the best for the job, or, in fact, he may put in a gas furnace for a purpose for which gas is quite unsuitable in the long run. Anyhow, he has effected his sale, and a little later on, when the repairs are found to be out of all proportion, or the gas consumption too heavy compared with the output, the gas manager is left with the task of combatting the prejudice which may quickly arise in all quarters against the employment of gas by reason of one or two ill-judged installations. The actual maker, being located in another town, and having for his field the whole of the country as well as many overseas, can afford to regard an occasional contretemps of this kind far more philosophically than can the gas manager. It is true that no maker can keep on supplying unsatisfactory apparatus without sooner or later coming to the end of his tether, but it is occasionally surprising how long the rope is and how much damage is done to the cause before the end of it is reached.

Examples of Incorrect Industrial Installations

The development of gas for industrial use has in the past received many checks from the ill-considered efforts of many small makers without the requisite experience in its applications who tackle the business as a profitable side-line on account of the simple nature of the apparatus supplied. It is true that as far as constructional details are concerned the average gas furnace is within the scope of the ordinary bricklayer, assisted by the local jobbing foundry, but it is in the practical application of such apparatus that the greatest amount of harm is done to the principles of gas heating. For instance, in one small town alone, the gas company were in the short space of a couple of months faced with a gas-burner installation so small that it would only pass a quarter of the amount of gas which was theoretically required by the boiler under which the outfit was placed, and in another case they found the installation of a plain cast-iron melting pot with ordinary bunsen burners underneath for the purpose of melting pure nickel, both of which impracticable jobs were being carried through without reference to the gas company. In another industrial area, the gas company experts found a crucible furnace being

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Photograph..... Processes.....
Drawing No.....
Catalogue No.....
Maker
Address
Appliance
Catalogue Name
Capacity
Dimensions Weight
Heating-up time minutes
Working Temperature Deg. C.
Consumption c. f. hr.
Pressures

	High	Low
Gas		
Air		

General construction
Description of process
Warnings

* * *

Second Page

If this apparatus can be seen in operation at any address within the area of supply of the ..... Company, the maker should here state:

Name of Firm. Address Manager

* * *

Third Page

Particulars of results of applications of these appliances, to be furnished by maker.

* * *

Fourth Page

Notes upon these appliances (by Gas Company)

A Four-Page Report

Taking Your Personal Inventory

An analysis of a saleman's errors

M. G. Weaver

Assistant Advertising Manager of the Illinois Power and Light Corporation, Chicago, Illinois

NOW is a good time for all of us to sit down and list the mistakes and disappointments that come with the past year and analyze each one separately. When we ask ourselves the "why" of each error, in nine cases out of ten we find that the faults lay almost entirely at our own doorstep. If we had only known, or understood better, we would probably have less to regret and more for which to be thankful.

This also applies in the sales game. A salesman only sells in order to make a living, and a good salesman constantly endeavors to sell more in order to increase his income. But there are times when he fails to close a sale—times when the prospect slips out of his grasp just when he is ready to "sign on the dotted line."

Analyzing Your Sales Efforts

Why? When you ask yourself that question you will not find a ready answer until you have analyzed yourself and your sales effort during the past year.

Have you made a consistent sales effort? The steady, plodding salesman, like the tortoise of Æsop Fable fame, gets there and almost always wins out, for he gains momentum as the sales roll in.

Have you been enthusiastic about your work? If not, why not? Enthusiasm generates a pleasant feeling that puts your prospect's mind in tune wtih yours and helps to break down his buying resistance.

Have you been perfectly familiar with the product you were selling? Nothing is perhaps so important in successful sales as a knowledge of the product, sufficient to explain it to the prospect's entire satisfaction.

Presenting Your Sales Arguments

Have you known the best way to present your arguments? Trying to sell without knowing how to present your sales arguments in a logical, orderly way is like trying to start your automobile without turning on the ignition. Eventually you will have to say the things that go to make a sale, but, in the meantime, you may wear out your prospect just as you do your automobile battery, and perhaps lose the sale.

Have you constantly been on the alert for new ideas that will help you to increase your sales? If you have, you are succeeding. If not, you had best find the sources of information and plug away for new ideas and suggestions that you can use to bring in more money to you.

"Selling the Company" Back of the Product

Have you sold the "company back of the product you were selling?" This is important, for it lends that unmeasurable strength of conviction to your sales effort when you know, and can make the prospect believe, that the company stands back of everything you say.

Have you been "On the Job" from the start to the finish? If you have taken time off to do anything else but sell, you have lost golden opportunities that might just as well have brought extra money for you.

Have you confidence in yourself and in the product you are selling? Nothing succeeds like success, and success is built up on confidence. Your confidence in yourself and in the product you sell is in direct proportion to the sales you make.

Have you been a real salesman? A good salesman sells people who do not want to or are not yet ready to buy. People who want to buy can give their orders to anyone—to an order taker.

Take Advantage of Every Opportunity

Have you taken advantage of every opportunity to sell the same prospect more than one article? The best prospect in the world for an ironer is a person who has just purchased a washer. Remember that the prospect at hand is worth two or three at home.

Have you been uncertain about your product, your ability, the time to make the greatest effort to sell, when to close your sales argument? If you have hesitated, you undoubtedly have lost sales because uncertainty kills time and breeds lack of confidence as well.

Have you been idle for a few moments every day? Idle moments never bring in the cash. They lose it, for time itself is worth money. A few idle moments every day is the equivalent of at least fifty hours lost every year—a whole week of sales effort. Think of it! How much better it would be to make every minute count and then take a real rest or vacation and get a new foothold on the business of selling.

Selling On a System

Have you sold on a systematic plan? If your sales efforts have been haphazard, your sales have been unsuccessful. Have a daily program, arrange your prospects in a definite manner, make as many calls as you can—for your income depends upon how many sales you make.

Have you analyzed your job from A to Z? Thinking about the job one has to do often results in the generation of new ideas to help you sell.

Have you boosted your company in every possible way? If you have not, you have hurt your sales record, for every person whom you meet is a po-

(Continued on page 1326)

GAS MERCHANDISING

Domestic – Industrial

Combatting the Post Holiday Slump

A few suggestions of timely interest

W. B. Stoddard

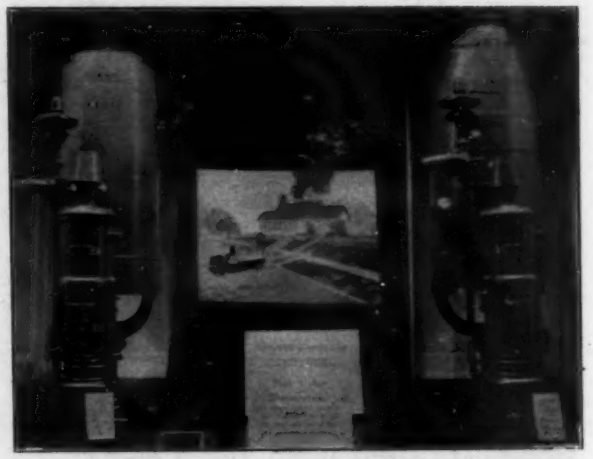
FORMERLY most gas men, as well as other merchants, thought it was "fate," and resigned themselves to a big post holiday slump, feeling they could not expect very liberal buying in January, when people had purchased to the limit in December. That notion, however, has been relegated to the past, along with a number of others. The modern gas man knows that people will buy any month in the year if the merchandise is attractive in price and quality.

Hundreds of people have received checks or cash for Christmas presents, and you may be sure that they are going to spend it, at least, most of it. Why not advertise especially to these people? Quote quality, not price. Give them some good advice about putting the money into something that will be of permanent benefit to the home, the installation of gas for cooking, heating and lighting, or the purchase of gas merchandise, instead of frittering it away on candy, cigars, movies and other like ephemeral pleasures. Be sure that the department stores, jewelers and women's specialty shops are doing this, and if you want to get your share of the Christmas gift money, come out with your most attractive newspaper advertisements, window trims and interior decorations during the months of January and February.

The Comfort of the Hot Water Heater

There is nothing that will add more to the comfort of a home than a hot water heater. Urge the householder to invest his money in one and have it installed during the slack season. In the spring, when everyone is having heaters put in, it is almost impossible to secure prompt service, and if it is done in January or February it will be ready for use the first warm days of spring, when the furnace fire is out and hot water is wanted in abundance for house cleaning and other domestic purposes. If this idea is set before your patrons in a logical manner, by newspaper ads, direct mail advertising and attractive window displays, it will materially increase January and February sales.

The Peoples Gas Stores, Chicago, had an excellent display along this line. Realizing that the tanks and gas heaters were of a neutral color and needed something brilliant to bring them to the attention of the public, they hung in the center of the background long, sweeping curtains of green velvet, draped with garlands of red flowers and gilded leaves, while on an easel was a large picture of a modern house and grounds, with an auto truck delivering a gas heater. At each side of the curtain were tanks and gas heaters, and a card close to the glass suggested:



An Excellent Water Heater Display Window

* * * * * * * * * * *
* HOT WATER FOR SUMMER TIME IS *
* ALWAYS NECESSARY *
* You can have it at any time or all the time *
* with one of these gas-fired Water Heaters *
* * * * * * * * * * *

Another card called attention to the advantageous terms on which one of the gas water heaters could be secured. They offered terms of $15.00

(Continued on page 1325)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 51

Change of State *(continued)*

TABULATIONS OF SPECIFIC HEAT

Specific Heats of Solids

1. ELEMENTS.

	Specific heat	—Temperatures— Cent.	Fahr.
Aluminum	0.2089	0	32
	0.2226	20-100	68-212
Antimony	0.0508		
Arsenic	0.083		
Barium	0.0470		
Bismuth, melted	0.0380		
Cadmium	0.0567		
Calcium	0.1670		
Carbon amorphous	0.2739	500	932
Carbon graphitic	0.241	0	32
	0.310	16-1000	61-1832
Cerium	0.0450		
Chromium	0.0998		
Cobalt	0.1069		
Copper cast	0.0924	17	62
	0.0985	30	572
Copper	0.0951		
Didymium	0.0456		
Gallium	0.079		
Germanium	0.0737		
Gold	0.0324		
Iodine	0.0541		
Indium	0.0570		
Iridium	0.0326		
Iron, pure	0.1765	500	392
	0.218	720-1000	1328-1832
Iron, cast	0.1298		
Iron, wrought	0.1138		
Lanthanum	0.0449		
Lead	0.0314		
Lead, cast	0.0299	15	59
Lead, melted	0.0402		
Manganese	0.1441		
Molybdenum	0.0722		
Nickel	0.1086	21-99	69-210
	0.1608	1000	1832
Osmium	0.0311		
Palladium	0.0593		
Phosphorus	0.1887		
Platinum	0.0324		
Potassium	0.1700		
Rhodium	0.0580		
Ruthenium	0.0611		
Silicon	0.0203		
Sodium	0.2934		
Silver	0.0570		
Steel, hard	0.1175		
Steel, soft	0.1165		
Sulphur	0.2026		
Sulphur, melted	0.2340		
Tellurium	0.0475		
Tin	0.0562		
Tin, melted	0.0637		
Tin, cast	0.0538	16-197	69-387
Tungsten	0.0363		
Uranium	0.0276		
Zinc	0.0935	0-100	32-212
Zirconium	0.066		

2. COMMON SUBSTANCES.

Alumina	0.1970		
Basalt	0.21		
Bronze	0.0858	15-98	59-208
Beeswax	0.4500		
Brass	0.0939		
Brick work, masonry, about.	0.2		
Butter	0.55		
Clay	0.197		
Chalk	0.2150		
Charcoal	0.2410		
Clay, burnt	0.1850		
Coal	0.2 to 0.241		
Coke	0.2030		
Corundum	0.1980		
Fir	0.6500		
Glass	0.1937		
Glass, Jena	0.188		
Gypsum	0.1970		
Ice	0.5040		
Magnesia	0.2220		
Marble	0.2100		
Oak	0.5700		
Pear wood	0.5000		
Pine (turpentine)	0.4670		
Quartz	0.1880		
Quicklime	0.2170		
Sand, river	0.1950		
Silica	0.19100		
Soda	0.2310		
Stone	0.2 to 0.22		
Wood	0.45 to 0.65		

3. LIQUIDS.

Acetic acid	0.4125		
Alcohol, grain	0.6479	40	104
Alcohol, wood	0.590	5-10	41-50

Benzene	0.3402	10	50-104	Petroleum	0.4340
Bismuth	0.363	280-380	536-716	Sulphuric acid	0.3350
Bromine	0.1071			Sea water	0.903 to 0.98
Ether, ethyl	0.4810			Tar	0.4130
Fusel oil	0.0564			Turpentine	0.4720
Gasoline	0.5332			Water (standard)	1.0000
Glycerine	0.6120			Salt solution, 5%	0.9306
Kerosene	0.4747			Salt solution, 10%	0.8909
Mercury	0.0333			Salt solution, 15%	0.8606
Oil, linseed	0.5300			Salt solution, 20%	0.8490
Olive oil	0.3100			Salt solution, 25%	0.8073

A National Meeting of Gas Men

The East to gather with the West on the Pacific Coast

VITAL problems facing the present and future development of the manufactured gas industry will be discussed by the executive heads of the most important public utility companies in America at a conference of the Executive Board and Advisory Council of the American Gas Association to be held at the Palace Hotel, San Francisco, January 29 and 30, 1925.

Invited guests include many outstanding figures in the public utility industry. Practically every section of the country will be represented.

First Meeting of Its Kind

This is the first time in the history of the gas industry that a meeting of this kind has been held on the Pacific Coast. San Francisco was chosen because it affords a splendid opportunity for the gas men on the Pacific Coast to meet with their friends from the East and discuss problems that are of concern to every one in the business.

President Abell will preside at the two-day meeting, and an address will be made by W. E. Creed, president of the Pacific Gas and Electric Company. Some of the more important topics to be discussed are:

Gas Making Methods and Materials.
Rates, Rate Schedules and Charges for Gas.
Competition.
Public Relations.
Customer and Employee Ownership of Securities.
Safety.
Company Group Insurance.
Statistics.

Henry L. Doherty of New York will lead the discussion on gas making methods and materials. R. B. Brown of Milwaukee and W. G. Vincent of the Pacific Gas and Electric Company have been invited by the board to lead the discussion on rates, rate schedules and charges for gas. The general subject of competition will be presented by Henry O. Loebell of New York; B. J. Mullaney of Chicago and A. B. Macbeth and A. B. Day, both of Los Angeles, will lead the discussion on public relations; and Charles A. Munroe of St. Louis will present the subject of customer and employee ownership of s ties.

Many Important Subjects

A number of the subjects assigned have been subdivided into related topics, and these in turn will be discussed by men whose official positions in the industry make them admirably qualified to handle the subjects effectively. For example, under the general title of gas making methods and materials, the following topics are to be discussed: Gas reforming, immediate and ultimate supply of oil for gas making, oil gas manufacture on the Pacific Coast and its adaptability further East, complete gasification of coal, low temperature gasification, combination water and coal gas plants, relation of gas rates to securing of industrial gas business, continuous stu of gas making methods, etc.

A special committee of the Executive Board appointed to draft the program has included subjects which are of outstanding importance at this time. Definite assignment of topics have been made already and discussions will be carried on by executives who have been notified in advance. Prospects are favorable for one of the most valuable meetings of executives ever held under the auspices of the association and it is hoped that the deliberations of the conference will be of direct benefit to the entire industry.

Large Companies to Be Represented

Some of the larger public utility holding companies which will be represented at the conference by their directing heads are: United Gas Improve-

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As The Journal Views It

THE WEST TO MEET THE EAST

It has become almost trite to say that the East cannot meet the West, for they have been doing so frequently since the composition of the famous maxim to the contrary. Now comes the interesting and important announcement that at the end of the month of January a meeting will be held in San Francisco at which there will be present a representative delegation of Eastern gas men. Some of the most prominent gas men of the East will be present at that meeting and will take active part in discussions of vital importance to the American gas industry.

This is the first time that such a meeting has been proposed in the history of the gas industry in this country. It will be a meeting at which there will be represented practically every section of the country. It will be a meeting where the topics of discussion will be the outstanding problems of the gas industry today. The discussions that will take place will be led by leaders in the gas industry of the United States and will be read with keen interest by every member of the gas fraternity. It is an opportunity which the gas industry will have to take advantage of, such as has never arisen before.

It is an important step for the gas industry. It is a most commendable undertaking, this bringing together of our fellow gas men of the Pacific Coast to meet the outstanding figures in the gas industry of the East. There will be given an opportunity, heretofore not available, of hearing first hand the opinions and ideas of men who have helped make the gas industry what it is today. The gas industry of the East will also be able to read accurate and detailed reports of what takes place at these meetings, particularly the discussions on the principal gas problems of the day.

Just to illustrate the comprehensive character of the discussion, it is sufficient to mention a few of the subjects that will be brought up before that meeting. For example, gas reforming, immediate and ultimate supply of oil for gas making, complete gasification of coal, combination water and coal gas plants, the relation between rates and industrial gas business, the problems of public relations, customer and employee ownership of securities, safety work—are just a few of the subjects that will engage the attention of the gas men at that meeting.

The gas industry is national in scope. The basic problems of Eastern and Western gas companies are the same, although local details may differ. The solution of the fundamental difficulties which face the American Gas Industry and which have been potent in retarding its growth can be effectively solved only when all concerned meet and thresh them out to the final adoption of a plan of national scope for their solution. Concerted effort on the part of all the gas companies of the country, those in the West as well as in the East, will make for far greater results within much less time than any individual effort of a single gas company.

The San Francisco meeting spells co-operative and united effort. It is the kind of a project that cannot but produce worth-while results. It is to the great credit of the officials of the American Gas Association and the Pacific Coast Gas Association that such a meeting has been arranged for. It is to be hoped that it will be but the forerunner of many of similar nature, which will tend to promote a better feeling amongst all the gas men of our country.

THE YEAR IN RETROSPECT

Although the calendar year does not as a general rule coincide with the fiscal year of the average gas company, and neither with the convention year of the American Gas Association, nevertheless it is customary, when the new year comes around, to sit back and ponder over what has taken place in the twelvemonth just completed. This is the time for retrospection, and also for preparation for the coming year.

The year 1924 has been one of considerable achievement and great promise to the gas industry at large. During that year gas made considerable progress, and the plans of the gas industry for future work are such as to make for still further advance in gas and its uses.

The gas industry has by no means been standing still. It has been steadily going ahead, undertaking new things of far-reaching importance. It is no longer necessary to call attention to the fact that the industry has found itself. That stage is past. For now we see this great important enterprise girding up its loins for real battle in industrial fields. It is now no longer content to take what comes its way, but is prepared to go after what is its just due. Gas is the fuel of all industry, and the gas industry is coming to realize that this must be its battle cry in overcoming such resistance as may be offered it.

The American Gas Journal is glad to say that the year 1924 has been for it one of considerable progress. Several innovations were undertaken during that year and they have been received unanimously with approbation amongst the gas men. The reprinting of the Catechism of Central Station Gas Engineering, and the publication of the series of Industrial Gas Lessons have constituted significant features which have attracted wide attention and have been heartily approved by all gas men. Both these features will continue on into the new year, the Catechism being completed in its early part, while the Industrial Gas Lessons will continue throughout the year.

It is expected that the Industrial Gas Lessons will soon reach that stage where individual industrial gas applications will be taken up. The "Fuel of the Future" series will continue and will be devoted from now on to the consideration of important industrial fields, wherein gas is used as a fuel. There will also be published many important articles on all phases of the gas industry, and The Journal will continue the excellent service that it has always given in reporting the conventions, including that at Atlantic City, and publishing the papers delivered therein.

Furthermore, The American Gas Journal wishes to announce two new features for the year 1925. One of these will be a series of merchandising hints, conducted by a man who has had considerable experience as a gas salesman and merchandising manager. These suggestions will be all of a practical nature, derived from actual experience, and should prove of considerable value to all commercial men.

A special service will also commence with the first issue of January for the technical man. This service will be for the essential purpose of keeping gas engineers and technical men in the gas industry informed of all developments along technical lines all over the civilized world. This service will be in the nature of a series of abstracts from patents and articles. They will appear each week in The American Gas Journal and will be indexed in a cumulative manner in the last issue of each month. It is aimed through this service to enable the technical gas men to keep in touch with what is going on in the industry, not only in this country, but in England, France, Germany and all other countries where gas is manufactured and used as a fuel.

The American Gas Journal wishes also to take this opportunity of thanking all its friends, its contributors and those who have co-operated with it in any way during the past year. This co-oporation has enabled The American Gas Journal to render best service to the entire gas industry. We ask for a continuation of this commendable spirit during the year 1925, so that we may continue serving the industry as we have done for the past sixty-five years. We desire also to extend our best wishes to all our friends for the coming year, 1925.

LEADING SECURITIES NOW GAS AND ELECTRIC

"Gas and electric light and power securities, of all public utility securities, at present hold a commanding place in the investment public's eye. And rightly, for the service rendered by these two giants of the public utility family (water alone not counted), is perhaps the most necessary of all the service rendered by public utility companies," says B. C. Cobb, vice-president of Hodenpyl, Hardy & Co., investment bankers, in "The Nation's Business."

"The fact that gas securities have during the past twenty years of transition somewhat lost the lead to those issued by electric light and power companies does not in any way mean that they have been crowded off the boards. While the lighting field of gas companies has largely been taken over by the electric companies, their sales for other purposes, fuel for cooking and for the industries, have increased enormously. This surely is proof of the stability of the business and an indication of its possibilities. In addition to all this, the advancement of the business and the improvement in manufacturing methods have been more rapid in the past ten years than in any prior twenty-year period," says Mr. Cobb.

"Since 1905 the growth of the electric light and power companies has been phenomenal. Not only has this growth been in the lighting field, but in the power and industrial field as well. And it is altogether likely that the record for the next ten years will be equally astounding, for those who know best say that the development of the industry has only just begun."

Catechism of Central Station Gas Engineering in the United States

Installment No. 51.

(Continued from last week)

not be possible to make the connections exactly as shown on the cut, but the same general arrangement should be adhered to. All the pipe and fittings used for water connections should be made of galvanized iron and should be large enough to permit a free flow of water so that the circulation through the heater will not be checked.

Gallons Heated by Gas Water Heater

274. A gas water heater has an efficiency of 75 per cent. It burns 45 cu. ft. per hour of a gas having a calorific value of 595 B.t.u. Assuming that a gallon of water weighs 8.33 lb., how many gallons per minute can it heat from a temperature of 50 deg. F. to one of 130 deg. F.? Give your calculations.

Ans. The total number of B.t.u. produced in one hour by the combustion of the gas under the assumed conditions will be $595 \times 45 = 26{,}775$, but since the efficiency of the water heater is 75 per cent, the number of B.t.u. available for heating the water will only be $26{,}775 \times 0.75 = 20{,}081$ per hour, which divided by 60 gives 334.68 per minute.

A B.t.u. being the amount of heat required to raise the temperature of one pound of water 1 deg. F., there will be required to raise the temperature of one gallon, weighing 8.33 lb., from 50 deg. F. to 130 deg. F. $8.33 \times (130\text{-}50) = 8.33 \times 80 = 666.40$ B.t.u.

Then

$$\frac{\text{334.68 (whole number of heat units available)}}{\text{666.40 (number of heat units required per gal. water)}} = 0.5$$

equals the number of gallons of water the temperature of which can be raised the required amount in a minute.

Efficiency of Instantaneous Heater

275. An instantaneous water heater burning gas at the rate of 81 cubic feet per hour will heat water from a temperature of 54 deg. F. to 117 deg. F. at the rate of 72 gallons per hour. The gas has a calorific value of 650 B.t.u. per cubic foot. What is the efficiency of the heater?

Ans. Under the conditions stated in the question the amount of heat developed in the heater per hour by the gas used is 81 (number of cubic feet of gas consumed per hour) $\times$ 650 (calorific value of a cubic foot) = 52,650 B.t.u. The useful work done is measured by the amount of heat put into the water passing through the heater. The temperature of the water is raised $117 - 54 = 63$ deg. F. and the weight heated to this extent is 72 (number of gallons heated per hour) $\times$ 8.33 (weight of a gallon of water in pounds) = 599.76 lb. Therefore, the gas consumed does an amount of useful work equal to $599.76 \times 63 = 37{,}785$ B.t.u. and the efficiency of the heater is $\frac{37785}{52650} = 71.7$ per cent.

Use of Gas Engines

276. What are the arguments in favor of the use of gas engines in place of steam engines, especially for small sizes, that is, up to 15 or 20 H. P.?

Ans. Ordinarily the cost of a gas engine of the sizes specified is about equal to the combined cost of a steam engine and boiler of the same capacity, and except in cases where a boiler plant is already in use for other purposes, and has sufficient margin for the extension required, the investment in a gas engine is no greater than for an equivalent steam plant.

The cost of fuel for a gas engine and for a steam engine is, under ordinary working, approximately the same for the sizes specified. For the steam engine it would be, say, 10 lb. of coal at $4.00 per net ton, equal to 2c. per H. P. hour. For the gas engine it would be 20 cu. ft. of gas at $1.00 per 1,000 cu. ft., equal to 2c. per H. P. hour.

Advantages

From this point on the advantages and economy are all in favor of the gas engine.

1. No boiler is required, with its mechanical accessories, including coal and ash storage, so that less space is required, thus saving in rental, taxes, insurance and depreciation.

2. There are no coal and ashes to handle, and there is no smoke.

3. There is less fire risk and less danger of explosion.

4. There is no waiting to get up steam, for the gas engine can be started or stopped immediately, and the expense does not begin until it is started, and ends when it is stopped.

5. The wages of fireman and engineer are saved.

6. A gas engine of the sizes specified can generally be located on any floor of a building, thus saving in shafting and belts, and in the loss of power incurred by their use.

Regulating Pressure Variations Over Gas Engine Operation

277. When a gas engine is connected to a comparatively small street main, its operation will, unless special precautions are taken, cause a fluctuation in pressure which may affect the use of lighting and cooking appliances in the neighborhood. What means would you employ to prevent such a fluctuation in pressure from being produced in the street main when the engine is running?

Ans. This question was brought up and discussed at the 1903 meeting of the American Gas Light Association, and several methods of overcoming the fluctuation of pressure were described.

The simplest method, which, however, applies only where the load is fairly constant, is to put a stop cock on the inlet to the gas bag and, by partly shutting the cock, compel the gas to pass into the bag at a practically uniform rate just sufficient to supply the quantity of gas required by the engine. The bag acts as a reservoir which is emptied when the engine draws gas, and is filled again during the interval between explosions, and as the pull on the portion of the pipe in front of the stop cock is kept more constant the fluctuation in pressure is reduced. This method will give slightly better results when two bags are used in tandem instead of one. When it is employed care must be taken not to shut off the stop cock to such an extent as to prevent the engine from getting all the gas it requires and thus to prevent it from developing the power needed.

Use of Diaphragm Governor

A more elaborate method based upon the same principle is to use a diaphragm governor followed by a reservoir or tank from which the engine draws its gas. An ordinary kitchen boiler will make a good reservoir. Sometimes a length of pipe of a diameter larger than that of the rest of the run between the regulator and the engine is used as the reservoir.

This method gives good results with engines running at relatively high rates of speed or with multiple cylinder engines which draw gas at a comparatively steady rate, but with large single cylinder engines running at slow speeds the simple reservoir must be made very large. In such cases a reservoir is used which is partly filled with some non-volatile liquid, one portion of the surface of which is in communication with the outside air, while gas stands in the part of the reservoir over the rest of the surface. This part of the reservoir is in direct communication with both the engine and the service pipe. When the engine pulls gas the pressure in the reservoir is reduced and the air acting on the liquid forces it up into the gas space, and thus drives gas out from this space to the engine. In the intervals between the suction strokes of the engine the supply of gas in the reservoir is replenished from the service and the liquid brought back to its normal level.

A small gas holder will, under the same conditions, absolutely prevent the passing back to the street main of any fluctuation in pressure, no matter how much the load varies, but such a holder is comparatively expensive.

All of these methods employ the same principle, that of having a store of gas, fed at a constant rate, from which the engine can draw its supply without reducing the pressure as much as if it drew directly from the service.

The Efficiency of a Gas Engine

278. What are the conditions leading to efficiency of working in a gas engine?

Ans. The essential conditions for efficiency in a gas engine are:

1. The largest volume of cylinder with the smallest circumferential surface; in other words, the largest diameter of cylinder.
2. Maximum speed of piston.
3. Greatest possible expansion.
4. Highest possible pressure at the beginning of the explosion.

These conditions were first laid down by Beau de Rochas in 1862. They all tend to insure the least possible loss of heat from the cooling effects of the walls of the cylinder and through the exhaust, and, consequently, tend to secure the greatest possible utilization of the heat produced by the combustion of the gas and therefore the greatest possible efficiency of the gas engine.

Calorific Value and Consumption of Gas per H.P.

279. How does the calorific value of gas affect the consumption per horse power in a gas engine, and what do you consider a fair average rate of consumption per brake horse power for a 10-horse engine using a gas having a calorific value of 600 B.t.u. per cubic foot.

Ans. A gas engine is a heat engine, that is, an engine in which energy in the form of heat is converted into mechanical energy, and, since a definite amount of heat is required to produce any given amount of mechanical energy, it follows that the greater the calorific value of the gas used in a gas engine the smaller the amount required per hour per horse power developed. If the gas engine were capable of using, with the same efficiency, gases of any calorific value, the respective amounts of the different gases required per hour per horse power would vary inversely as their calorific values. It is found, however, that for various reasons gas engines work a little more efficiently when using gas of comparatively low calorific value, 10 to 300 B.t.u per cubic foot, so that they require somewhat less of the low value, in comparison with the higher value, gas than is called for by the relation between the calorific values

Our Program for 1925

IN continuation of its policy of making the AMERICAN GAS JOURNAL the gas man's paper, a publication wherein each gas man, no matter what particular phase of the industry he is following, may find matter of interest, it is with pleasure that we announce the ***inauguration of two new departments for 1925,*** and the continuation of those that have been running throughout the year 1924.

Two New Departments for 1925

1. A Service for the Technical Man

A regular weekly digest of technical progress in the manufacture, distribution and use of gas. Concise and complete abstracts of technical information published in the technical papers and patent literature of the world. *The technical man's most effective and rapid way of keeping in touch with developments in gas technology everywhere.*

A *cumulative index* will appear in the last issue of each month. Also a service to furnish photostats of original articles and patents and translations at cost.

2. A Service for the Commercial Man

A regular weekly department, run by a commercial man of long experience as a gas salesman and merchandising manager. *Hints, Suggestions, Ideas of practical value culled from actual experience in gas merchandising.* A weekly page or two wherein the commercial gas man will find many ideas, proven by practical experience to be successful, and which he can apply to advantage in his own company.

These Other Features Continued from 1924

1. The Catechism of Central Station Gas Engineering

Continuation of installments of the Catechism to completion, with an index.

2. Industrial Gas Lessons

Continuation of the study of the laws of heat as applied to gas. Development of the industrial application of gas, giving concise and complete details of methods of calculation, principles of the use and effectiveness of gas in each case.

6. Articles on all phases of the Industry

The American Gas Journal will continue its policy of publishing articles written by representative gas men on all phases of the gas industry—the technical, the commercial, the industrial, the publicity, the advertising, the accounting, the educational, etc., etc.

7. Conventions and Meetings

The American Gas Journal will contain, as usual, accurate and timely reports of all Conventions and Meetings. It will publish in full all

application of gas, giving concise and complete details of methods of calculation, principles of the use and effectiveness of gas in each case.

3. *Gas Wrinkles*

A new series of Gas Wrinkles, hitherto unpublished. *Practical Suggestions for the technical man.*

4. *Industrial Gas Articles*

Continuation of a series of articles answering the objections raised against the sale of gas for industrial purposes. Articles containing basic information of interest to every industrial gas man. Other articles by well-known industrial gas men on the industrial uses for gas.

5. *The Fuel of the Future*

The series, now concerned with the heat treatment of metals will be continued. Important, valuable and practical information on methods of calculating heat treatment jobs, the design of furnaces, their operation and the results obtained. A mass of *original, remarkably complete and essentially practical information hitherto unpublished* has been rendered available for these and other articles of the series.

The Fuel of the Future series will hereafter discuss in complete detail all of the important industrial applications of gas.

The American Gas Journal will contain, as usual, accurate and timely reports of all Conventions and Meetings. It will publish in full all articles, papers, and addresses of interest and importance delivered at these meetings.

8. *Translations*

From time to time there will be published translations of foreign articles written by the leading gas technologists of France, England, Germany, Italy, etc., containing information of importance to the American gas engineer and of such character as to have definite bearing on American Gas practice.

9. *Market Report and News*

Each issue will contain as usual the latest quotations on coal, coke, gas oil, petroleum and other commodities of interest to the gas man. The news of the industry will give the gas man, as heretofore, all important news items of the week, pertaining to gas and its allied interests.

10. *Daily Issues at the Annual Convention*

As has been its practice for the past three years, the American Gas Journal will report the proceedings of the Seventh Annual Convention of the American Gas Association in Atlantic City, N. J., in a series of five Convention Dailies. These have become known as unique in trade paper journalism, representing an undertaking and service such as is rendered by but few and equalled by none in any of the American industries.

This is our program. We want your support. If you have been a subscriber during 1924, we want you to renew your subscription for 1925. There are many good things in store for you during that year, more so perhaps than in the past year.

If you are not a subscriber, we want you to join the fold and know what it means, what real, practical value you can obtain by *receiving and reading your own copy of the American Gas Journal.*

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_____ 192__

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In any case, the consumption of gas per horse power will vary with the condition in which the engine is kept and upon the proportion between the load it is carrying and that which it is capable of carrying, since when working at or near its full load the engine has a greater mechanical efficiency than when running under a small load. Under favorable conditions a 10-horse power gas engine can be run on a consumption of 20 cu. ft. per brake horse power per hour when using gas of a calorific value of 600 B.t.u., but the average consumption under actual working conditions will be about 25 cubic feet per brake horse power per hour.

Operations of Various Gas Engines

280. Describe the cycle or series of operations and the method of governing employed in each of the following gas engines: Otto, Westinghouse, and Korting.

Ans. The so-called "Otto cycle" in gas engines is a four-phase cycle carried out in a single-acting cylinder open at the end toward the crank, and provided with a tightly-fitting piston which is free to move back and forth.

Starting with the piston at the beginning of an out-stroke the cycle is as follows: As the piston moves out on the forward stroke, the charge of gas and air is drawn in and fills the cylinder. The in or back stroke compresses the charge into the clearance space. At the dead point at the end of this second stroke, the charge is ignited and the resulting explosion drives the piston out on its second forward stroke. The succeeding in-stroke expels the products of combustion from the cylinder and the cycle is completed, the piston being in its first position and ready to repeat the same series of operations. It will be seen that the cycle requires four strokes of the piston for its completion, and that of these four the third is only the motor-stroke, the power required to carry on the others being derived from the energy stored in the fly-wheel during the third stroke. It will be seen also that there is only one explosion for each two revolutions of the fly-wheel.

This cycle was first described and advocated in 1862 by M. Beau de Rochas, and is properly called the Beau de Rochas Cycle, but it was not put into practical use until 1876, when it was adopted in the Otto Silent Engine, the first gas engine that was commercially successful and one which held the field almost to the exclusion of all others until the patent expired.

The Otto Engine

The Otto engine is governed on what is known as the "hit or miss" principle, that is, either a full charge or no charge at all is taken into the cylinder and exploded, the governor working on the gas valve in such a way that no gas is admitted to the cylinder as long as the engine is running at its normal speed, the valve opening only when the number of revolutions falls below that for which the governor is set. Thus, when running on a light load, the engine may miss either every other explosion or two out of every three, or so on, according to the load. This method of governing by admitting charges of full size only, makes the degree of compression of every charge the same, and thus causes all the gas to be employed under the most economical conditions for any particular engine, but it permits, in fact depends upon, comparatively wide variations in speed, and therefore is not satisfactory when close speed regulation is important.

The Westinghouse Engine

The Westinghouse gas engine also employs the Beau de Rochas four-stroke cycle, but has always two cylinders, and in the larger examples three, the pistons working in which are connected to the same crank shaft, thus securing in the smaller sizes one working stroke to each revolution, and in the larger three working strokes to each two revolutions.

The speed is governed, not only by the "hit or miss' method of doing away with the explosions entirely when the speed runs above the normal, but by regulating the amount of the explosive mixture admitted to the cylinder in each complete cycle in a manner similar to that employed for governing steam engines. In this way an explosion is secured in each cylinder for each four strokes, but the force of the explosion is varied in accordance with the amount of work to be done. The ports of the valves regulating the admission of gas and air to the cylinder are so arranged that their areas can be adjusted to give a mixture containing the desired proportions of air and gas entirely apart from the action of the governor, which simply controls the length of stroke of these valves, so that varying quantities of a mixture containing always the same proportions of air and gas (so long as the adjustment spoken of is unchanged) are admitted into the cylinder. This method of governing keeps the speed more uniform than the "hit or miss" method, but since the volume of the charge is varied for each cycle the amount of compression is also varied and the engine is not always working at the most economical degree of compression. For this reason an engine so governed uses much more gas per horse power per hour, other things being equal, than does one governed in the other way. However, when the work to be done calls for great uniformity of speed, the loss in economy may easily be more than counterbalanced by the closer speed regulation, especially when gas is cheap.

The Korting Engine

As originally made in small sizes, the Korting engine also employed the Beau de Rochas Cycle in a single acting cylinder, the governing being done by varying the strength of the charges. As now made in large sizes, 500 H. P. and over, with especial reference to the use of blast-furnace gas, the Korting is a two-cycle double-acting engine, with two ex-

plosions for every revolution. The two-cycle working in the main engine cylinder is secured by the use of two auxiliary pump cylinders, one being used for air and the other for gas. These two pump cylinders are in line and their pistons are fastened on a common rod driven by a crank set at an angle of 110 deg. in advance of the main crank of the engine. The connections between the pumps and the main cylinder are such that gas and air from the rear end of the pumps can pass only to the rear end of the cylinder and vice versa.

Considering the main piston as starting from the rear end of the cylinder, it travels forward until it uncovers the exhaust ports, which are located in the middle of the cylinder and are unprovided with valves, being opened and closed by the main piston itself. As soon as these ports are uncovered the pressure in the rear of the cylinder falls to atmospheric and the admission valve is opened slightly before the piston reaches the end of the forward stroke. During the latter part of the forward travel of the main piston the pump pistons have been traveling backwards and air has been compressed into the air pressure pipe. The gas pump valves are so arranged that the gas is not compressed at as early a point in the stroke as is the air, and as the air pressure pipe and the gas pressure pipe both deliver into a common valve chamber, the opening from which into the cylinder is controlled by a single valve, the air which is being delivered at a higher pressure at the moment the admission valve opens forces back the gas and at first only air enters the cylinder. The exhaust ports being still uncovered, this air first forces the products of combustion out of the cylinder, and then, as the ports are closed, is supposed to form a layer next to the piston, leaving at the back of the cylinder a mixture richer in gas than would be the case if gas were admitted from the first. As the pump piston travels back the gas becomes compressed in the rear end of the gas pump, and, the excess of pressure in the air pipe and the rear end of the air pump having been reduced by the escape of part of the air into the main cylinder at atmospheric pressure, both air and gas pass into the cylinder until the admission valve closes as the pump pistons reach the rear ends of the cylinders. The proper proportion between gas and air is secured by having the areas of the air and gas cylinders bear the desired relation to each other.

By the time the admission valve closes the engine piston has traveled through almost half of its backward stroke. During the rest of this stroke the mixture of air and gas is compressed, and when the stroke is completed this mixture is ignited, and by its combustion forces the piston out on the forward stroke. An exactly similar set of operations occurs in the forward ends of the main cylinder and the pump cylinders, and is repeated at each end of the cylinders for each revolution.

Governing the Engine

The governing of the Korting engine is done by varying the strength of the charge, but in a different manner from that employed in the Westinghouse. In the latter the proportion between the amounts of air and gas is always the same, no matter how small the charge. In the former the quantity of air admitted is not changed, the governor controlling only the quantity of gas used. This is done by changing the time at which compression begins in the gas pump, and thus the time at which gas begins to enter the engine cylinder, the admission of gas being advanced or retarded as more or less power is required. During the time that the chosen proportion of air, and it is claimed that this gas is entering the cylinder it is mixed with the mixture forms a layer at the end of the cylinder and is not diffused to any great extent through the air that is first admitted, and that thus certainty of ignition is secured even with small quantities of gas. The volume of air being the same for every charge, the total volume of the charge and therefore the degree of compression does not vary as much as in the case of engines governed as is the Westinghouse.

Description of Cycles

281. Describe the complete cycle, or series of operations, employed by each of the following gas engines: Clerk, Griffin, and Atkinson Cycle.

Ans. The Clerk engine employed the Beau de Rochas Cycle, but secured an explosion in the motor cylinder to each revolution by the use of an auxiliary cylinder called the displacer cylinder. The piston working in this cylinder was connected to the crank shaft at an angle of 90 deg. in advance of the motor piston. It therefore began its out-stroke, drawing the charge of air and gas into the displacer cylinder, when the motor piston was in the middle of the in-stroke, and continued this out-stroke until the motor piston had passed its inner dead point and returned to the middle of its out-stroke. The displacer piston began its in-stroke, slightly compressing the charge, and soon after the continued outward travel of the motor piston uncovered the exhaust ports near the front end of the motor cylinder and thus reduced the pressure of this cylinder to that of the atmosphere. The pressure in the displacer cylinder was now higher than that in the motor cylinder and lifted an automatic valve in the communicating passage between the two cylinders, and the charge entered the motor cylinder, where it was expanded by the heat of the walls, and swept out ahead of it through the open exhaust ports the products of combustion from the previous explosion. The motor piston had now reached the end of its out-stroke, and returning on the in-stroke covered the exhaust ports, and put a pressure on the charge in the motor cylinder. The automatic valve immediately closed, cutting off the communication with the displacer cylinder, the charge was compressed into the clearance space of the motor cylinder, ignited at the dead point of the motor piston and the explosion took place, forcing the motor piston out again, the displacer piston being half a stroke ahead. By the series of operations above described this engine not only secured an explosion for each revolution, but also got rid of almost all of the products of combustion. It was economical compared with other engines made at the same time but is no longer manufactured.

(Fifty-second Installment Next Week)

Naphthalene Formation and Removal

An apparatus designed to prevent naphthalene deposits

IN an article by H. P. Lupton in the Gas Journal it is stated that in vertical retorts the naphthalene content of the gas is low. This seems to be due to the fact that at no one time is a large mass of coal undergoing carbonization, and that the gas produced passes rapidly from the retort with a minimum amount of exposure to either radiant heat from the sides of the retort or to the heat from a body of incandescent coke.

It is well known that a dry gas will not deposit naphthalene as readily as will a wet gas. The condensation of moisture may give the necessary shock for the formation of naphthalene crystals, or the decrease in volume of the gas due to this loss of moisture may decrease the carrying power of the gas. Be that as it may, where deposition of naphthalene has taken place, it is frequently found that the section of main preceding the deposit is especially wet.

When the gas leaves the works, it may or may not be saturated with naphthalene vapor. Some time during the year the gas will be subjected to a lower temperature than that at which it leaves the works. Sooner or later, according to the amount of naphthalene originally present, a temperature is reached when the gas must throw out some of it. When this takes place, the vapor changes into a white crystalline solid; and this is the possible foundation of a future stoppage.

The source of all the trouble is, then, temperature change and the fact that naphthalene changes from a state of vapor directly into a solid.

Methods for Lowering Naphthalene Content

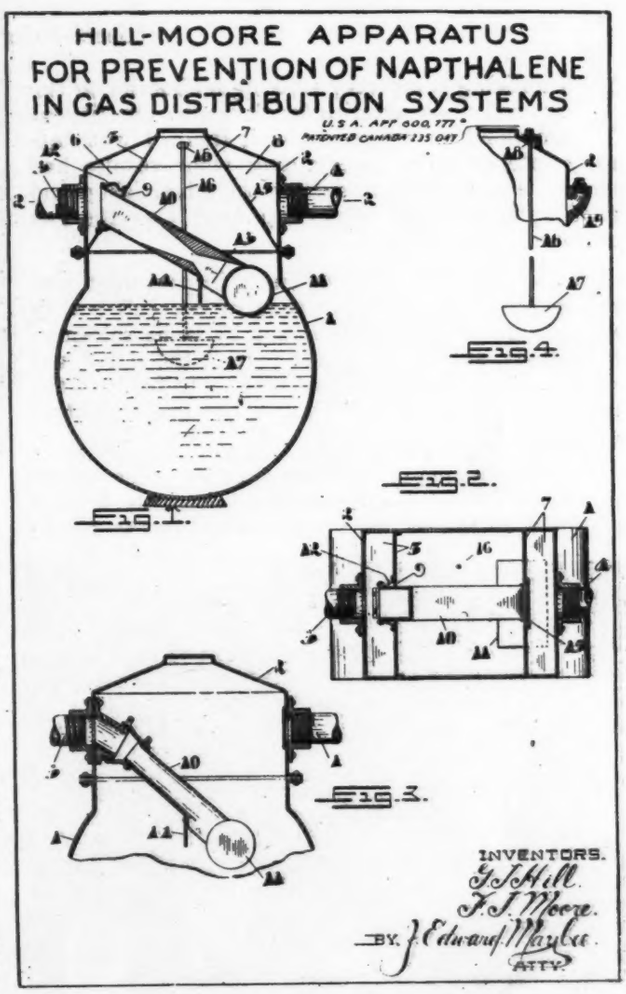
In a great number of works some method is adopted which has for its object the lowering of the naphthalene content of the gas. Among others, the following methods may be mentioned:

1. Sudden condensation, or "shock cooling," of the crude gas.
2. Washing the gas by means of an oil free from naphthalene.
3. Volatilization into the gas of an oil which has a strong affinity for naphthalene.
4. Spraying into the distribution system an oil which has similar properties to those mentioned in 3.

Conclusions

As a result of this inquiry, the following conclusions were drawn: For the effective prevention of the deposition of solid naphthalene, it is essential that the gas should be saturated, or as nearly saturated as possible, with vapors which, when condensed, are good solvents of naphthalene. Such being the case, it follows that the higher the boiling point of the oil, the more effective will the vapor be, provided, of course, that sufficient vapor can be carried by the gas. In the majority of oils tested, the boiling point is so high that the amount of oil which can be taken up as true vapor is too low to prevent naphthalene deposition. To secure the required amount of the solvent at present in use, it would be necessary to introduce it into the gas in the form of a mist or spray.

The author then describes experiences with washing the gas by means of an oil free from naphthalene.



The cost of the system is very low, since all the spent oil is used in the carburetted water-gas plant, being, for that purpose, mixed with unused oil in

the proportion of about 1 to 5. The net cost is 0.03d. per 1,000 cubic feet of gas—a figure which compares very favorably with that which is frequently expended in clearing mains and services.

A few words might be said on the methods of testing for naphthalene.

The most reliable test seems to be to have a test bottle containing a solution of picric acid on the stream of gas just as it leaves the washer, and so regulate the flow of oil through the washer that the test solution just shows, or just fails to show, traces of naphthalene picrate when ten cubic feet of gas are passing at the rate of one cubic foot an hour through the apparatus.

The Hill-Moore apparatus shown in drawings, and which will be manufactured by a firm of gas apparatus manufacturers in Scotland, was invented to meet the situation as described. The gas enters inlet 2 and is conveyed into contact with a liquid having all necessary properties for prevention of naphthalene formations. The apparatus will connect at outlet of gas plant station meter in series with transmission mains.

Advertising an Ad.

Portland, Oregon, creates "ad^2" and "ad^3 in gas advertisements

(Special Correspondent)

IN noticing some very striking billboards on the several main arteries leading into the city of Portland on my recent visit there, I was naturally interested in ascertaining what results had been obtained from this style of advertising and called upon the man who originated it at the gas company.

I found that the New Business Department was mailing out just about the time of my call a very handsome letter signed in person by some salesman or saleslady, and on the lower part of the letter was a picture of an old gentleman reading in front of the radiantfire. I recognized this as the same illustration which I had seen on the billboards.

The sales manager told me that in order to try out the effect of the letter and billboards he had purposely refrained from advertising in the newspapers for the time being, and that the results in sales had been very satisfactory, in spite of the fact that at the beginning of the campaign the weather turned so warm that the mailing of the letters had to be stopped temporarily.

On the Billboard

The Original Reproduction in a Show Window

As I entered the store of the gas company I noticed a similar reproduction of the old gentleman in the show window, and secured photographs, which you are at liberty to publish.

If the billboard is a reproduction of the letterhead —in other words, is an ad. copying an ad., then according to the rules of algebra it would become an ad^2.

As the window is an ad. copying the billboard, which copied the letterhead, it stands to reason that, according to the same rules, the window would be an ad^3.

I have often read about tieing up window displays with other advertising, but this is about the most emphatic tie-up that has come to my notice.

The very day that I called at the gas company there was an ad. in the daily papers reproducing one of the billboards and announcing this special sale on "unheard of" terms.

COMBATTING THE POST HOLIDAY SLUMP

(Continued from page 1310)

down, and eighteen months to pay the balance, together with a liberal allowance for the old heater if one had previously been in use.

Getting After the Bargain Hunter

Then there is another class of customer—the bargain hunters. They are waiting for prices to come down. They have made up their mind that prices were raised 50 per cent just before the holidays and that by sitting back until January they will reap their reward. Humor them. Few reputable gas men advance rates or prices on merchandise before Christmas, but there is no use trying to convince

Display of Christmas Left-Overs

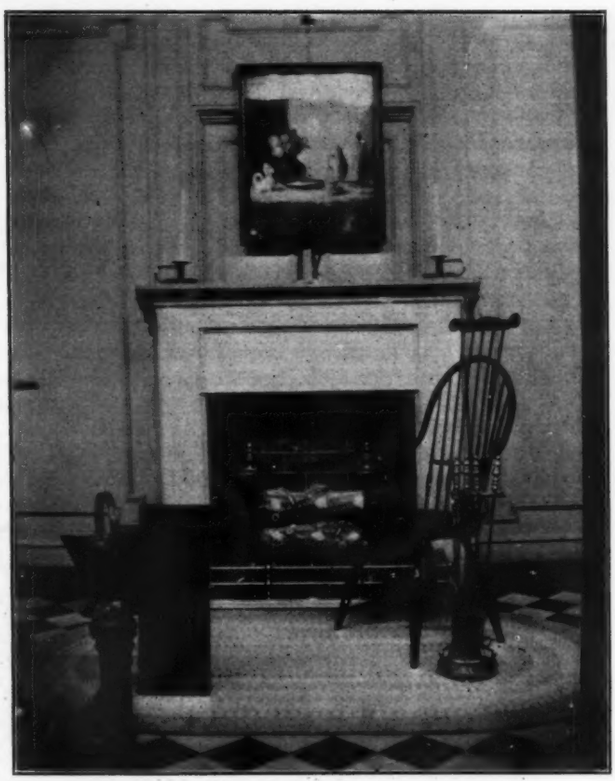
the bargain hunter of this fact. She wants a bargain. Give it to her. There are numerous odds and ends, slow sellers and the like, that it is better to move at a sacrifice than to keep warming the shelves that should be filled with new goods and quick turnovers in supplies and appliances. Arrange a window full of bargains; display them on stands near the door after the fashion of variety stores; put them where everybody will see them; mark them attractively; and they will sell in January the same as in any other month.

Sale of Christmas Left-Overs

The Rochester Railway and Light Company, Rochester, N. Y., had a good idea. They announced in big letters in their newspaper ad, and by a canvas sign extending entirely across the building, "Half Price Sale of Christmas Leftovers." A number of articles, including some discontinued lines, were displayed on counters extending down the central aisle of the main floor sales room. People came to look them over and in so doing saw articles of standard use displayed on either side of the bargain counters, and, even if they did not purchase at the time, they had a chance to see the complete line carried. Among the sale lines was a lot of globes, which for some reason had moved slowly. Samples of these were shown on masses of black velvet in the window, presenting a most attractive appearance. Boxes of mantles, sold at reduced prices in quantities, were also displayed. In the rear was a box covered with black felt, and on this, picked out in little boxes of mantles, were the words, "C. E. Z. Lights."

A "New England Home" Display

One of the windows arranged by Barker Bros., Los. Angeles, Cal., to feature their New Year's gifts showed a colonial living room, with rag rug, and a mantle of severe design, on which were two copper candlesticks. A chair was drown up to the fireplace, which was painted inside to simulate brick, and within the aperature, on brass and irons, were a set of gas logs. A card of dark green, lettered in cherry red, suggested: "Nothing makes so much for charm as an open fireplace. Enjoy the fascination of the old New England home, without



Featuring the "New England Home"

the labor and dirt involved in a wood fire. Gas logs give the same effect, plus cleanliness."

Another clever advertising stunt to gain attention for themselves and their line was undertaken by the

local gas company of Berlin, Wis. Before daylight, on the morning of January 1, they sent a number of boys to tag every residence in town. Of course, this would have been impossible in a big city, but in a moderate size town, by dividing it into sections, the work was accomplished in several hours. These cards were of red, printed in green letters, and bore the message, "Wishing You a Happy New Year—Berlin Gas Co." There was no advertising on the cards, and the bright little tags looked very cheerful fluttering in the breeze as they were observed by early risers. The distinctive coloring and uniformity of the cards made them easily recognizable as coming from the gas company, once a close up of one of them was obtained—and in this way the firm was brought to the attention of everyone in the thriving mid-western city.

A NATIONAL MEETING OF GAS MEN

(Continued from page 1312)

ment Company, Electric Bond and Share Company, Commonwealth Power Corporation, Middle West Utilities Company, American Power and Light Company, C. H. Tenney & Co., Stone & Webster, Henry L. Doherty & Co., Massachusetts Lighting Company, Public Service Company of Colorado, United Light and Power Company, American Gas Company, Pacific Gas and Electric Company and the C. H. Geist Company.

Prominent Men Invited

Among the most prominent officials invited are: Gen. Charles G. Dawes, Rufus C. Dawes, Samuel Insull, Martin Insull, W. A. Baehr, J. G. Learned, Halford Erickson and B. J. Mullaney, of Chicago; Geo. B. Cortelyou, S. Z. Mitchell, B. C. Cobb, A. E. Forstall, Oscar H. Fogg, J. H. Jourdan, W. H. Barthold, H L. Doherty and Donald McDonald, of New York; D. D. Barnum, C. H. Tenney, J. L. Richards, W. E. McKay, A. E. Childs and F. P. Royce, of Boston; Randall Morgan, P H. Gadsden, C. H. Geist, J. D. McIlhenny and John Gribbel, of Philadelphia; A. B. Macbeth, F. R. Bain, A. B. Day and William Baurhyte, of Los Angeles; W. E. Creed, F. A. Leach, Jr., A. F. Hockenbeamer, Ray S. Fuller, W. S. Yard, C. P. Cutten and Frank Wills, of San Francisco.

Others invited include the executive heads of important public utility interests in every part of the country, as well as the members of the Executive Board and Advisory Council of the American Gas Association.

TAKING YOUR PERSONAL INVENTORY

(Continued from page 1309)

tential prospect for some product your company has for sale.

Have you taken time outside of actual working hours to go over your work of the day, to analyze your weaknesses? If you have, you have benefited. One always benefits through experience and by the mistakes he makes.

Expecting Something for Nothing

And, lastly, have you expected something for nothing? Have you been content to sit back and be satisfied with the daily sales you make? Remember that you cannot get something for nothing. You are paid only for what you actually sell. Then use your best efforts to increase your sales every day.

Have you asked yourself these questions? If you have, you probably found several points that may not have occurred to you before—points on which you can make improvement during the coming year. Make a note of them so that you can refer to them every day. Remember that your ultimate success is worth your constant daily efforts. Then you can say, with Coue, "Day by day, in every way, my sales are growing better and better."

POLITICAL OPERATION OF PUBLIC UTILITIES COSTLY, U. S. STATISTICS INDICATE

Political operation of public utilities is proving very expensive in the few large cities of the nation where the experiment is under way, according to figures tabulated by the U. S. Department of Commerce, which provides the following enlightening table:

	Pop. July 1, 1922 U. S. Census Est.	1922	1918	% Increase
Detroit	993,678	$120.30	$33.49	259
Los Angeles ..	634,866	99.34	44.07	125
Omaha	200,739	67.15	33.59*	100
Seattle	315,685	110.73	58.91*	88
Cleveland	854,565	69.09	36.91*	87
Tacoma	100,369	60.87	33.67*	81
San Francisco..	529,792	63.08	43.76	44

*1917.

University Students Visit Ann Arbor Utility Plants During Open House Week in Michigan

CONTROL IN THE INDUSTRIAL GAS BUSINESS

(Continued from page 1308)

installed for brass melting, the only provision for heating being gas burners at ordinary main pressure without any air blast.

Keeping Records

In the endeavor to guard against installations of this description, some of the gas undertakings in Britain which cultivate the industrial load require apparatus makers to submit copies of any quotations the latter may make in the company's area of supply. By this means, the gas manager has an opportunity of considering the facts of the case before the final step is taken and the furnace installed. One prominent authority also have an elaborate system of records in the preparation of which all the principal furnace makers have collaborated, which gives their officials in readily accessible form particulars of practically every type, size and make of furnace which is likely to be required in their area. The following is a copy:

[779—21423]

CITY OF BIRMINGHAM GAS DEPARTMENT

Reference Number	
Ours	Yours

INDUSTRIAL HEATING DEPARTMENT.
COUNCIL HOUSE.

TRADER'S RETURN OF FURNACES.

Name of Firm		Date	
Address		Manager's Name	
Nature of Business carried on by Firm			
Type of Furnace Ordered or Purchased		Inner Dimensions	
Catalogue No.		Temperature Reqd	
Gas Consumption per furnace per hour		Number of Furnaces to be used	
State whether Furnace is "High Pressure" "Natural Draught," or "Air Blast."			
Does the Firm wish to consult this Department			
Other Information			
Name of Furnace Maker		Signature of Firm's Representative	
Representative's Name			

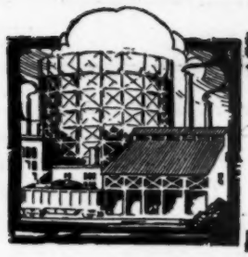
Growth of Industrial Gas in Birmingham

In Birmingham, the gas undertaking keeps a tight hold on the industrial side of the business by requiring all furnace makers to submit full particulars AT THE TIME OF PURCHASE of every order they receive for appliances to be installed in that area in the simple form which follows. The growth of the industrial demand for gas of late years compared with the total output is given by Mr. Hems (of the Birmingham Industrial Gas Department) in a recent paper as follows: 1911, 5.06 per cent; 1914, 8.31 per cent; 1918, 22.33 per cent; 1921, 17.09 per cent; 1923, 15.22 per cent, and 1924, 17.12 per cent.

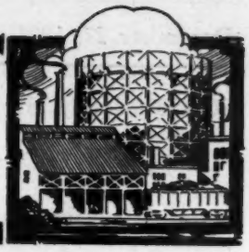
Success of Undertaking

It is not to be supposed that efforts for the control of the situation in Britain have not met with a certain amount of opposition on the part of manufacturers of apparatus, but in that country fortunately the solution of the problem is considerably simplified by the fact that with the majority of makers the greater portion of their output consists of heaters, ranges and similar domestic apparatus, for which the gas companies are the principal buyers, and as the production of industrial furnaces is small compared with the value of the output of domestic apparatus, it has been found that in cases where a manufacturer shows a disposition to resent the application of a very small amount of essential control in the conduct of the industrial heating business, a diversion of some portion of the gas company's orders for domestic apparatus is usually sufficient to quickly bring such a maker into line. The smaller type of manufacturer who may specialize in gas furnaces without touching domestic gas apparatus is rather more difficult to control, but even here most of them find sooner or later that the good-will of the gas company is an asset of considerable value if they wish to sell their goods in the latter's area, and with this reward before them they are sooner or later amenable to reason.

Gas companies which have in the past been sufficiently far-sighted and sufficiently strong to deal with the industrial trade on these lines have no cause to fear for the future of this branch of the demand, and by the exercise of an enlightened and constant control over the business in their area have attained in the industrial field the same position which they have so long held in regard to domestic work—that of final arbiter upon all questions affecting the use of gas in their area of supply.



NEWS OF THE GAS INDUSTRY



Pacific Gas Association Holds First Meeting of Year

The first meeting of the Pacific Coast Gas Association for its fiscal year 1925 was held at the Hotel Whitcomb, San Francisco, on November 20 and 21.

The main purpose of the gathering was to bring in for conferences all committeemen so far appointed, and to give section chairmen an opportunity to give to their committees their instructions for the year's work as outlined by the board of directors.

President E. L. Hall, Vice-President F. J. Schafer and all members of the directory were present at an all-day session of the board of directors on November 20, and parallel sessions of the accounting, technical and commercial sections were in progress on the afternoon of November 20 and the morning of November 21. The afternoon of November 21 was spent in inspecting the plants of the Pacific Gas and Electric Company in the Bay districts.

Approximately 100 members of the association lunched together on November 20 and 150 were present at a dinner that evening, at which President E. L. Hall presided. Mr. C. S. Knight, director of the California Development Association, was the principal speaker and he delivered a very pertinent message on the opportunities presented in the industrial life of the state.

Great Interest Being Shown in Gas Engineering

Prof. C. L. Cory, dean of mechanical engineering at the University of California, was scheduled to speak, but, being unavoidably detained, sent a message outlining the growing interest which is being evinced by students at the university in gas engineering, this being largely due to the splendid gas laboratory recently presented to the university by the Pacific Coast Gas Association.

The entire meeting was very constructive and inspiring to all committee workers who were able to attend.

The next meeting of the association will take place in Los Angeles early in 1925, and it is planned at that time to present whatever committee reports are completed in order to relieve the congestion which is sure to take place on the convention program.

Meter Course at Iowa State College

The fourth annual gas meter short course, sponsored jointly by the I. D. G. A. and the engineering department of the Iowa State College at Ames, was held at Ames, Iowa, on December 9 to 13.

The school this year was an outstanding success and set a standard for others that will be difficult to exceed. Registration last year was the highest of any and totalled 84, which attendance was far surpassed at this course, when the registration showed 141 in attendance from 15 states: Iowa, Minnesota, Missouri, Nevada, Kansas, North Dakota, South Dakota, Wisconsin, Illinois, Kentucky, Indiana, Michigan, Pennsylvania, Colorado, New York. Out of this attendance 129 were men actually engaged in the gas business in its usually accepted definition. The other 12 were members of state commissions, college professors or manufacturers' representatives.

The program was very complete and crowded a large amount of information into a few days for those who wanted to absorb it. In every case actual work was done by the men in attendance, in addition to listening to the explanation and lectures. Sixty-five of the 129 gas men took the bench work on practical gas meter repairing. Each class was in the hands of capable instructors and each student secured a valuable education.

One of the outstanding features was the extreme interest displayed by those in attendance. The meetings were started promptly on time, with everybody on the job. They showed real interest in their work and a desire to learn and do. They carefully took every opportunity to actually do the practical work under the guidance of their instructors and expressed the thought that they had received some real benefit from attending this course. The plan of the committee includes a general report being made to all the gas companies who are members of the I. D. G. A., so that they might know the work that is being done at this school and how it is being taken by those who attend, especially by their own employees.

Thursday evening was the occasion of the annual banquet, at which Mr. H. J. Carson, president of the I. D. G. A., presided. Mr. J. H. Ainsworth, manager of the gas company at Ames, proved an excellent host and provided a splendid program for this meeting.

The equipment used in this course was furnished through the courtesy of the American Meter Company, Sprague Meter Company, Des Moines Gas Company, Cedar Rapids Gas Company and the Peoples Light Company, Davenport, Iowa.

The course was held at the Iowa State College at Ames and was jointly sponsored by them. They devoted considerable of their facilities to it and provided instructors from their engineering staff. The school has always shown a remarkable spirit of co-operation which the association is happy to acknowledge with thanks.

Gas Company Is Planning to Start $2,000,000 Expansion Program

Miami, Fla.—With an expansion program to cost approximately $2,000,000, the Florida Power and Light Company, during the next five years, is arranging to improve

its service to meet the needs of Miami and its future growth during that period and for several years in advance.

Already certain improvements have been accomplished and others are under way which will cost $650,000 and give immediate relief from a condition that has resulted from the rapid growth of the city and its environs.

The gas interests of Miami changed its name from the Miami Gas Company to the Florida Power and Light Company in June, when the former company was purchased by the American Power and Light Company.

G. C. Estill, vice-president of the company, said:

"The extension program contemplates an expenditure of $650,000 during a seven months period from June 1 to January 1, which under ordinary conditions should have taken from 12 to 18 months to complete. Since the arrival of the machinery and piping we have been working our main laying forces from sun-up to sun-down and double shift on the plant enlargement so as to get this additional equipment all in service at as early a date as possible, and we now feel that a large majority of this equipment will be placed in service during the month of December.

"The major items involved in our present program are the purchase and installation of a million cubic foot gas holder, two new purifying boxes, a 400-horsepower boiler and washer cooler with the necessary auxiliary apparatus in connection with the above equipment, which will more than double the capacity of the present plant. This program contemplates laying about eight and a half miles additional mains, varying in sizes from 6 inches up to 16 inches.

"The Florida Power and Light Company is operated by the Electric Bond and Share Company of New York and is one of the three hundred public utility holdings of this company. They have for the past eighteen years operated public utility plants throughout the United States and during their entire period of operation have never been known to sell a single one of their holdings. They have endeavored to give the best of service and have not only secured the services of men well trained in the public utility game, but have secured men that are ready at all times to serve the public."

Publicity and Advertising Section Holds Committee Meeting

At a recent meeting of the managing committee of the Publicity and Advertising Section of the American Gas Association reports were made which illustrated in striking degree the remarkable impetus now being given to publicity and advertising work by the member companies of the association.

Secretary Person reported that the sale of literature issued from headquarters had set a new record mark. He said the two pamphlets, "Truths About the Meter" and "Hints for the Housewife," had been distributed by gas companies to more than one million customers. More than 75,000 copies of the pamphlet containing an interview with John Moody had been issued up to date, he reported, and other pamphlet matter was being ordered in steadily increasing quantities. Other sectional services such as the motion picture film, "Around the Clock With Gas," the illustrated lecture on the gas industry, and the monthly advertising service, were being used more extensively than ever before, it was announced.

In his report on the news service, Henry Obermeyer, assistant secretary of the section, said that of all stories now being published by the 27 committees on public utility information, at least one-half were issued from headquarters. This service had been greatly enlarged to cover trade papers outside the gas industry and other periodicals with large circulations, he reported.

Chairman Frank LeRoy Blanchard said that the rise of public utility securities, increased customer ownership activities, and the biggest new financing program in the history of the public utility business, have had their effect upon the work of the section. Inquiries for statistical matter of a financial nature have fairly flooded headquarters at times, he said, with the result that the various organizations and private concerns which issue information services for investors now turn to headquarters for authentic data on financial matters.

Announcement was made at the meeting of a marked decrease in the number of published articles and advertisements attacking or misrepresenting the industry. It was pointed out that one reason for this was that executives of companies no longer wait for the association to do something by way of retraction, but do the job themselves and then report to headquarters what they have done. Another reason mentioned was that the industry is advertising at a higher ratio than ever before and is increasing its customer ownership activities.

Following the business session of the committee, the members adjourned to the Columbia University Club, where the guest of honor was Frederick A. Farrar, vice-president of the Electric Bond and Share Company of New York. Mr. Farrar bears the distinction of having sold more public utility securities than any other living man. He delivered an inspiring talk on the relationship existing between the selling of securities and the proper use of publicity and advertising in building better public relations. Upon the completion of his address he was given a standing vote of thanks and the members expressed a desire to hear him again.

Gas Companies Enlist for Better Cooking Movement

Every other state in the Union will have at least one gas company which is engaged in home service work, according to plans of the American Gas Association for the next 12 months, which have just been announced.

Thirty gas companies at the present time have such a department as a part of their endeavor to help the gas user obtain the most efficient and economical service from his gas appliances. Nearly all of these home service depart-

ments are run by domestic science experts who continuously preach the gospel of better food and better cooking through radio talks, pamphlets, cooking classes and personal home instruction.

Forty additional gas companies are about to establish home service departments of their own. Plans are being perfected with the help of the Commercial Section of the American Gas Association under the personal supervision of Miss Ada Bessie Swann, Director of Home Service of the Public Service Electric and Gas Company of New Jersey.

Following is a list of gas companies who are doing home service work in their communities: Elkhart Gas and Fuel Company, Elkhart, Ind.; Utica Gas and Electric Company, Utica, N. Y.; Elmira Water, Light and Railroad Company, Elmira, N. Y.; Providence Gas Company, Providence, R. I.; The Gas Light Company of Augusta, Augusta, Ga.; New Haven Gas Light Company, New Haven, Conn.; Freeport Gas Company, Freeport, Ill.; El Paso Gas Company, El Paso, Texas; Consolidated Gas Company of New York, New York; Lake Superior District Power Company, Ashland, Wis.; the Peoples Gas Light and Coke Company, Chicago, Ill.; Adirondack Power and Light Corporation, Schenectady, N. Y.; the Sheridan Gas and Fuel Company, Sheridan, Wyo.; Truckee River Power Company, Reno, Nev.; Illinois Power and Light Corporation, St. Louis, Mo.; the East Ohio Gas Company, Cleveland, Ohio; Savannah Gas Company, Savannah, Ga.; Eastern Oregon Light and Power Company, Baker, Ore.; North Shore Gas Company, Waukegan, Ill.; the Laclede Gas Light Company, St. Louis, Mo.; the Luzerne County Gas and Electric Company, Kingston, Pa.; Brooklyn Borough Gas Company, Coney Island, N. Y.; Central Hudson Gas and Electric Company, Poughkeepsie, N. Y.; Portland Gas and Coke Company, Portland, Ore.; Public Service Electric and Gas Company, Newark, N. J.; Kings County Lighting Company, Brooklyn, N. Y.; the United Gas Improvement Company, Philadelphia, Pa.; City of Norwich Gas and Electrical Department, Norwich, Conn.; Cohoes Power and Light Company, Cohoes, N. Y.; Tacoma Gas and Fuel Company, Tacoma, Wash.

Among those which are expected to establish home service departments in the near future are: The Brooklyn Union Gas Company, Brooklyn, N. Y.; Lowell Gas Light Company, Lowell, Mass.; Citizens Gas and Fuel Company, Terre Haute, Ind.; Rochester Gas and Electric Corporation, Rochester, N. Y.; Peoples Light Company, Davenport, Iowa; Menominee and Marinette Light and Traction Company, Menominee, Mich; Meridian Light and Railway Company, Meridian, Miss.; Madison Gas and Electric Company, Madison, Wis.; Wisconsin Public Service Corporation, Sheboygan, Wis.; Portland Gas Light Company, Portland, Me.; Pennsylvania Power and Light Company, Allentown, Pa.; Union Gas and Electric Company, Bloomington, Ill.; Worcester Gas Light Company, Worcester, Mass.; the South Carolina Gas and Electric Company, Spartanburg, S. C.; Wausau Gas Company, Wausau, Wis.; Philadelphia Suburban Gas and Electric Company, Chester, Pa.; Georgia Railway and Power Company, Atlanta, Ga.; New Bedford Gas and Edison Light Company, New Bedford, Mass.; Milwaukee Gas Light Company, Milwaukee, Wis.; the Pawtucket Gas Company, Pawtucket, R. I.

$1 Gas Law Invalid in New York City

New York, N. Y.—James G. Graham, the special master appointed to take testimony in the litigation instituted by the gas companies to make ineffective the dollar gas law, has completed a tentative report, in which he sustains the contention of the companies that the law is confiscatory and unconstitutional. A similar report was made several months ago by Mr. Graham in relation to two subsidiaries of the Consolidated, the Queens Gas Company and the Bronx Gas and Electric Company.

Mr. Graham's report consists of 180 printed pages of figures and facts relating to the gas industry in this city. Hearings in the case were concluded last August. Mr. Graham has set December 22 as the time when the counsel engaged in the proceeding may appear before him and make their objections. James A. Donnelly, a special assistant to the Attorney General, said that it would be impossible to make a satisfactory digest of the report in so short a period, and expressed surprise that more time had not been accorded. He said:

"I shall ask for an extension of time because it is impossible to go through this report and prepare a synopsis in less than a month. The report is necessarily involved and contains computations of numerous tabulations of complicated figures—the cost of manufacture and distribution of gas, the original and reproduction costs of the plant of the company and similar matters.

12,000 Pages of Testimony

"The hearings have been going on for five months, during which 12,000 pages of testimony have been taken, and approximately 1,000 exhibits have been submitted. The hearings were closed on August 1 and Mr. Graham, presumably, has devoted the intervening time to preparing his report. To give counsel only a little more than a week to file objections seems unfair. I must carefully study the report in order to gather from it the basis on which the master reached his conclusions."

Mr. Graham finds not only that a dollar rate would be confiscatory, but that it would also be confiscatory to compel the company to furnish a quality of gas of 650 British thermal units, and that the $1.15 rate fixed by the Public Service Commission fails to yield a reasonable return on the investment. The dollar rate, he states, would not have yielded more than 3.4 per cent on the investment, at any time since the law was enacted, and only 2.5 per cent on the present value of the property.

He also finds that the bare operating expenses of the company were 85.89 cents per thousand cubic feet of gas in 1922, 82.63 in 1923 and at least 80.76 at the present time.

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Vertical Retorts

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Fitchburg, Mass.
Springfield, Mass.
Pawtucket, R. I.
Portland, Me.
Ottawa, Que.
Montreal, Que.
Fitchburg, Mass. (Repeat)
Pernambuco, Brazil
Santos, Brazil
Montreal, Que. (Repeat)
Vancouver, B. C.
Victoria, B. C.
Montreal, Que. (2nd Repeat)
Watertown, N. Y.
Malden, Mass.
Vancouver, B.C. (Repeat)
Toronto, Ont.
Medford, Ore.
Portland, Me. (Repeat)

COMBINED DAILY CAPACITY, 28,000,000 CU. FT.

The Glover-West System Gets the Most Out of the Coal

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of America, Inc.
150 Nassau St. New York

American Gas Journal

SIXTY-FIFTH YEAR

Published Weekly by American Gas Light Journal, Inc., 53 Park Place, New York, N. Y.

S. G. KRAKE, Pres. & Treas C. S. MYERS, Vice-Pres. A. M. GLEASON, Sec'y.

STANTON G. KRAKE, Managing Editor

ISMAR GINSBERG, Editor

"APPLICANT FOR MEMBERSHIP IN THE AUDIT BUREAU OF CIRCULATIONS"

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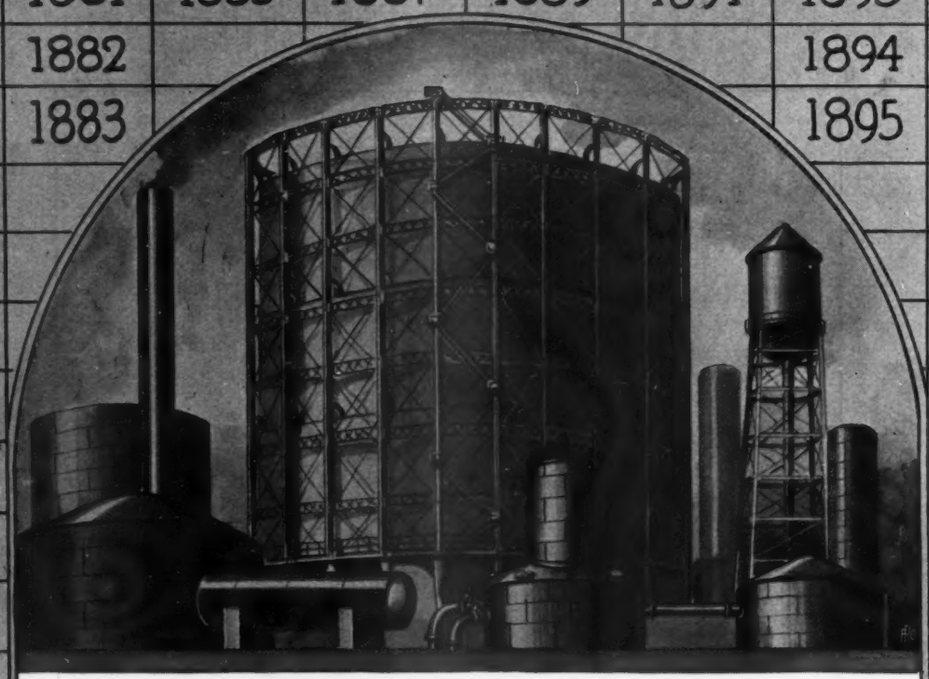

GAS HOLDERS AND TANKS

If you want to inspect a GAS HOLDER made by us before placing your next order, you won't have far to travel. With "OVER A THOUSAND GAS HOLDERS" to our credit, there is certain to be one at a Gas Plant nearby—regardless of where you are located. Ask us to send a list of nearby STACEY MANUFACTURING COMPANY Holders. Then inspect them. When you have noted their sturdy construction and design, also think of the extensive experience and manufacturing facilities we can put at your service!

THE STACEY MANUFACTURING Co

CINCINNATI—OHIO

J. FRANK STACEY, Pres. and Gen. Mgr. THOS. C. RANSHAW, Vice-Pres.
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For Fractional Condensation of Coal Gas

PRIMARY AND SECONDARY IMMERSION TAR EXTRACTORS

SECONDARY CONDENSERS
With Up and Down Flow of Gas and Water

ROTARY AMMONIA SCRUBBERS
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CAST IRON CONDENSERS FOR SALT WATER
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SHAVING SCRUBBERS & P. & A. TAR EXTRACTORS
For the Removal of Water Gas Tar

COMPLETE PURIFIER INSTALLATIONS
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SPECIAL CASTINGS, TEES, BENDS, ETC.

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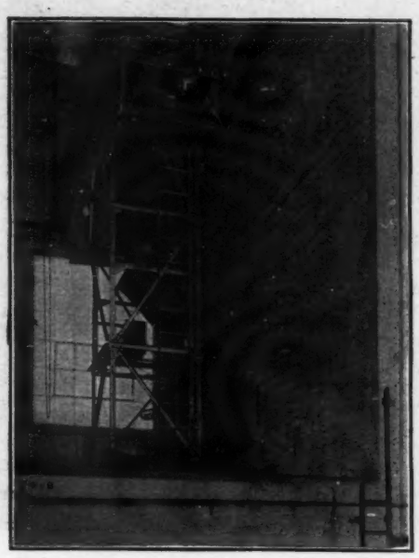
Gas Engineers and Builders of Gas Works

Main Office and Works: NEWARK, N. J.

Our Best Wishes



Hunt Weigh Larry in the Gas Plant of the Philadelphia Suburban Co., Chester, Pa. This Weigh Larry, Hopper and Chute are completely lined with maple wood to protect metal from abrasive action of the coke.

The New Year of 1925 will be close at hand when the members of the Gas Fraternity read this, our Greetings to them for a most Prosperous and Profitable New Year.

We hope our good wishes for "successes in larger measure," as expressed through these pages one year ago, have been fully realized during the year now drawing to the end.

Those far-sighted and able executives in every branch of the gas industry are indeed to be congratulated on the record of 1924. With the same indomitable spirit that actuated the pioneers of the infant industry of a century ago, they have achieved many splendid results in the past twelve months through their tenacious "stick-at-itiveness" and persistent "go-get-itiveness."

May Old Father Time, when he closes his book a year hence, be obliged to insert several extra leaves to record the achievements of the gas in-industry in its greater expansion during the dawning year.

Here, then, is a renewal of our pledge to you: "If Hunt Engineers can, with their over half a century's experience and accumulated data, be of assistance in making the new and succeeding years more prosperous, we cheerfully offer their services."

WE DESIGN AND BUILD:
Industrial Railways, Automatic Railways, Cable Railways, Cars, Tracks, Switches, Motor Cars, Scales, Conveyors, Skip Hoists, Electric Vibrating Screens, Cut-off Valves, or Gates, Weighing and Measuring Devices, Coal Crackers, "Stevedore" Transmission Rope and Hoisting Rope.

C. W HUNT COMPANY, Inc.

West New Brighton, New York City

New York Office—Whitehall Building

PHILLIPS LANG & CO., INC.,
431 S. Dearborn St., Chicago, Ill.

ERNEST F. LEARNED
141 Milk St., Boston 9, Mass.

ENGINEERING EQUIPMENT CO., LTD., 358 Beaver Hall Square, Montreal

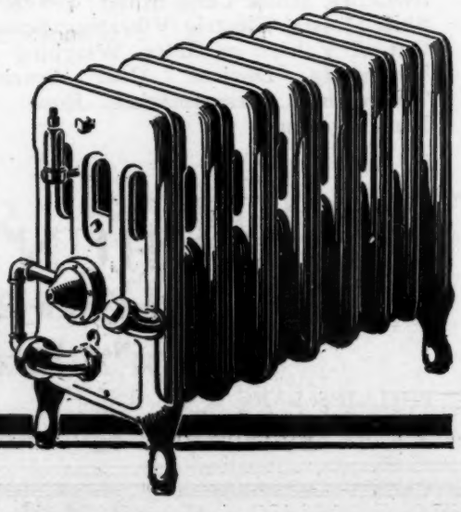
Clow Gasteam for Retail Stores

The Franklin Clothes Shop, Washington, D. C., is typical of the high-grade retail clothing business.

For such stores Clow Gasteam is ideal. Its cleanliness, convenience and economy are important factors. The elimination of the heating plant in the basement makes this part of the building available for storage or other purposes.

The attractive design of Clow Gasteam Radiators makes it possible to install them to the best advantage. The new Colonial Type, shown below, is particularly attractive.

JAMES B. CLOW & SONS
General Offices: 534-546 S. Franklin Street, Chicago
Sales Offices in principal cities



CLOW "GASTEAM"
HEATING SYSTEMS

U. G. I. WATER GAS APPARATUS

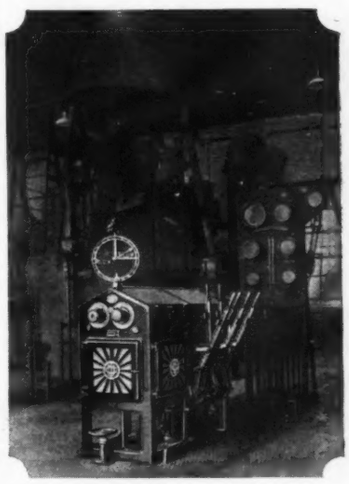
Carburetted Water Gas Apparatus

IN the art of Carburetted Water Gas manufacture, we have always occupied the pre-eminent position. As holders of the original patents and pioneer builders when the process was in its infancy, we developed the apparatus, as well as its appurtenances, from the first crude machines of forty years ago to the modern apparatus demanded by today's intensive practice.

U. G. I. Water Gas Apparatus represents the last word in scientific design and fabrication, based upon intelligent research and experimentation in our own physical laboratory. The apparatus is designed and built, not with the idea of producing something which can be sold at a low figure, but rather to produce an apparatus which will represent every dollar expended upon it and which will maintain the operating and repair costs at the lowest possible minimum.

THE U. G. I. Automatic Control can be placed on any hydraulically operated water gas apparatus, but it could not be applied to apparatus not having the hydraulic operating feature.

By the use of the U. G. I. Automatic Control appreciable savings are effected and the water gas apparatus is operated with greatly increased efficiency. By its use, the generator fuel is saved and the fuel bed maintained in better condition, producing a uniform quality of gases and a softer clinker, which can be easily and quickly removed. Likewise, the automatic control permits of shorter cycles, which in turn results in more uniform temperatures in the carburetor and a more complete and effective gasification of the oil.



Automatic Control of Water Gas Apparatus

THE U. G. I. CONTRACTING COMPANY

Broad and Arch Streets -- Philadelphia, Penna.

421 Peoples Gas Bldg., Chicago **928 Union Trust Bldg., Chicago**

Centre of Steel Materials
NEW CASTLE, PA.

A STRATEGIC LOCATION

Within a radius of fifty miles from New Castle all materials that enter into a gas holder can be purchased and requires only 24 hours to arrive in our plant. This assures speedy delivery.

Our plant is equipped with the last word in machinery for fabrication of gas holders and gas plant equipment.

Field erection under the supervision of a trained superintendent, famous for efficiency and experience. Modern equipment of latest design used in erection work to expedite completion date.

Pennsylvania Engineering Works

E. W. BEADEL, Pres. J. K. FURST, Vice-Pres. & Chief Engr. CHAS. L. BALDWIN, Treas

Gas Construction Division

MAIN OFFICE & WORKS: NEW CASTLE, PENNSYLVANIA

New York Office: 60 Wall Street, Suite 809

Superior Meters

"All that the Name Implies"

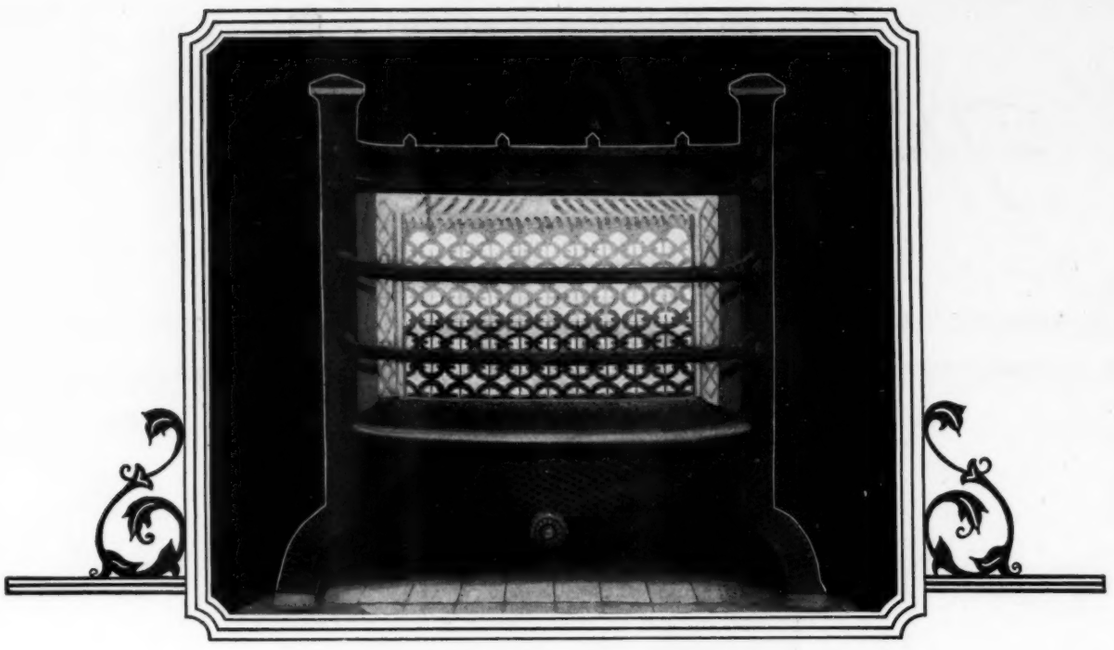
To Accurately Measure Gas
Superior Materials
Longer Life

SUPERIOR METER COMPANY

Bush Terminal Building No. 20

BROOKLYN, N. Y.

Pacific Coast Representative: The C. B. BABCOCK CO., 768 Mission St., San Francisco, Cal.



The Humphrey Radiantfire has established, through merit alone, an outstanding reputation for quality and value in the gas heating field.

Nor has this reputation been recently achieved--it has, as its foundation, the sound and substantial record of many years of leadership.

Wherever gas heating is used, the Humphrey Radiantfire enjoys a preference which sets it apart from all other gas heating devices now produced.

GENERAL GAS LIGHT COMPANY

KALAMAZOO, MICH.

NEW YORK, 44 W. BROADWAY SAN FRANCISCO, 768 MISSION STREET

Pittsburgh Buffalo Cincinnati Atlantic City

"IF IT'S HEAT YOU WANT YOU CAN DO IT BETTER WITH GAS—IT'S CLEANER"

The HUMPHREY

Radiantfire

TRADE MARK REG. U.S. PAT. OFF.

This is for You

Messrs. Commercial Managers,

Every Gas Company,

United States and Canada.

Commercial Gas Appliance Co.
BALTIMORE, MD.
213-215 GUILFORD AVE.,

Dear Sirs:

Several times we have written to you, calling your attention to the Acme Flue for Gas Ranges. Some of you gentleman have taken immediate advantage of our offer, and have profited by your wise judgment. Others have evidently looked upon our messages as sales letters for "Another piece of merchandise that I haven't the time to investigate! Anyhow, it doesn't burn gas."

The Acme Flue does not burn gas; but it renders an inestimable service to your company that is only secondary in value to your net sendout. It makes more contented and enthusiastic users of your biggest domestic gas consumer—the Gas Range—by adding the last point of perfection to this necessary kitchen appliance.

The Acme Flue attached to the oven vent of the range destroys all of the staining, greasy, smelling fumes, that now flow into the kitchen, discoloring the walls and causing a lot of hard, disagreeable labor to clean, and, finally, expense in painting.

You spend a great many thousands of dollars each year to create and maintain the good-will of the public. Here is an appliance that, from the very fact that it does not burn gas, will convince the housewife that your interest in her welfare is not confined to selling her gas only, but will help her make the kitchen more attractive, by keeping the walls clean, and the air healthier; save her time and labor; and the expense of repainting.

The Acme Flue is a potent producer of good-will that your company cannot ignore. *And you make 70% net on the invested money in selling it.*

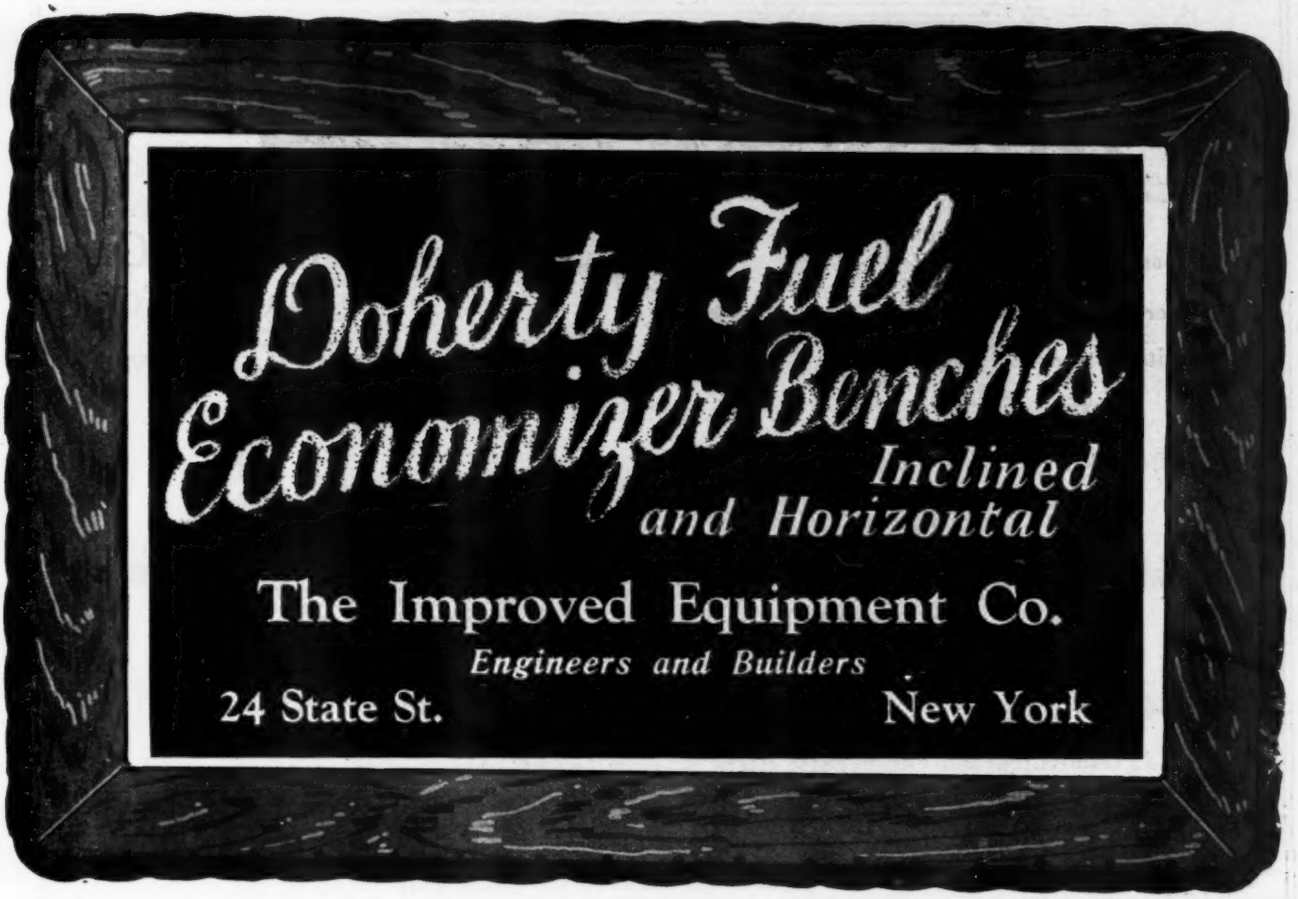
Each month we are going to print in this Journal a letter from one of our many friends who have recognized and are receiving the benefits pointed out above by selling the Acme Flue.

How much longer are you going to wait to allow us to help you help yourself?

COMMERCIAL GAS APPLIANCE COMPANY

Paul Frame

General Manager.



CAST IRON PIPE
AND FITTINGS

American Cast Iron Pipe Company
Birmingham, Ala.

SALES OFFICES IN PRINCIPAL CITIES

GLAMORGAN PIPE & FOUNDRY CO.
LYNCHBURG, VA.

GENERAL FOUNDERS AND MACHINISTS
Manufacturers of
CAST IRON PIPE
For Water and Gas, Flange Pipe and Fittings
Western Office: 466 Peoples Gas Bldg., Chicago

JAMES B. CLOW & SONS
General Offices:
534-546 South Franklin Street, Chicago
Works:
Coshocton, O. Chicago, Ill. Newcomerstown, O.
Sales offices in all principal cities
Manufacturers of Cast Iron Pipe and Fittings

LYNCHBURG FOUNDRY COMPANY
Manufacturers of
CAST IRON PIPE AND FITTINGS
Main Offices: LYNCHBURG, VA.
Works at Radford, Va. and Lynchburg, Va.

DONALDSON IRON CO.
EMAUS, LEHIGH CO., PA.
MANUFACTURERS OF
CAST IRON PIPE
FOR WATER AND GAS
ALSO SPECIAL CASTINGS AND FLANGE WORK

National Cast Iron Pipe Co.
Birmingham, Ala.
Manufacturers of
Cast Iron Water and Gas Pipe
SALES OFFICES:
Peoples Gas Building, Chicago, Ill.
Kirby Building, Dallas, Texas
Land Bank Building, Kansas City, Mo.
Matson Building, San Francisco, Cal.

FRICTION FACTORS IN AN OLD 24-IN. CAST-IRON PIPE

Velocity	Loss Between Observation Points, Lb.*	Loss in Feet, per 1,000 Ft.	Coefficient Hazen-Williams Formula	Coefficient "n" in Kutter's Formula	Loss per 1000 Ft. New Pipe by Weston
4.86	20	3.00	131.4	0.0109	3.80
4.75	17	2.53	140.8	0.0103	3.64
4.24	16	2.38	130.0	0.0112	2.89
4.30	15	2.23	136.5	0.0106	2.97
Average.....			134.7	0.0107	

* No difference in elevation of gauges.

The line tested was a 24-in. main running from the pumping station at the shore of Lake Michigan to the town of Hammond about five miles inland. A few connections tap into this main near the pumping station and then for a distance of 16,000 ft. there are no

Sustaining Carrying Capacity

The tabulation in the clipping reproduced above shows that after twenty-five years of service, this main had a carrying capacity equal to that of new pipe.

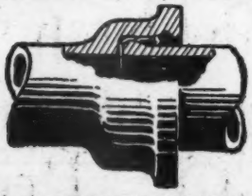
Tables of carrying capacities in common use indicate a loss of capacity due to age. These tables are designed to include the cases where tuberculation takes place. This trouble is the exception, not the rule, and unless there is reason to believe tuberculation will occur, Cast Iron Pipe can safely be counted upon to deliver its full capacity for life. Where tuberculation does take place, Cast Iron Pipe can be readily cleaned without injury to the pipe.

THE CAST IRON PIPE PUBLICITY BUREAU, Peoples Gas Building, Chicago

CAST IRON PIPE

Our new booklet, "Planning a Waterworks System," which covers the problem of water for the small town, will be sent on request

THE BELL & SPIGOT JOINT



THE ACCEPTED STANDARD FOR UNDERGROUND CONSTRUCTION

Send for booklet, "Cast Iron Pipe for Industrial Service," showing interesting installations to meet special problems

He "Soured" On His Mill Architect

And Mr. Architect *lost his best Client.*

The big corporation had steam at 150 pounds and could have had Ridgway Elevators.

Instead, Mr. Architect said, "We have our plans all drawn for the other kind and that's what goes in."

And in they went. At greater cost than Ridgway Elevators.

Then came the usual performance of juice losing, motor burning, overhead plunging and the regular monthly bill for repairs.

Then one day Ridgway met His Royal Highness at a Y. M. C. A. Convention.

"Ridgway, what is your business?" asked His Nibs.

"We make a special sort of elevator. We give the man who has steam or compressed air absolute perfection in elevator service."

"Do you have a representative in my city?"

"No, we have no agencies nor salesmen. We just make them for the big engineers and the big concerns who appreciate the importance of uninterrupted vertical transportation as a great money saver."

"Who do you make them for?"

"Standard Oil, Pennsylvania Railroad, New York World, American Smelting & Refining, Heinz 57. All the Big Gas Works, Packard Motor Co., American Radiator, Continental Motor, DuPont Powder, The Big Paper Mills, n'everybody who wants it good."

"Ridgway, tell me about your machines," said his Royal Highness.

And we did. Then his jaws snapped and his eyes looked mad as he cried: "Why in the dickens didn't my architect tell me about your elevators?"

He said he was having constant trouble with his elevator equipment and blamed the man who planned his mill.

We told him if he had only read the papers he would have found out what it means to

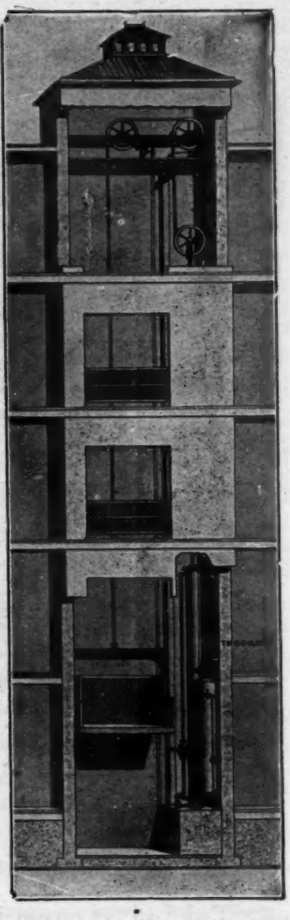
"HOOK 'ER TO THE BILER"

Craig Ridgway & Son Co.

Elevator Makers to the folks who are not "DEAD ONES" COATESVILLE, PA.

Double Geared

Direct Acting



PARKER-RUSSELL

St. Louis

Silica Retorts
Congdon Scrubber Standpipe
Fiddes Aldridge Charging Machines
Water Gas Linings
Boiler Setting Refractories
Ignition Arch Tile

Manufacturers of

"PARCO" Products

FULTON LOW PRESSURE GOVERNORS

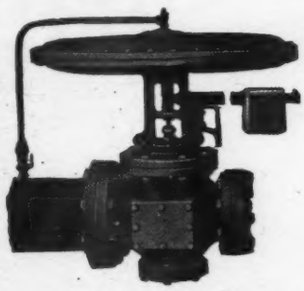
Fulton Low Pressure Governors are designed to reduce the pressure in the service mains as low as may be convenient for safe and economical combustion.

They are generally used to reduce from one to fifty pounds on the high pressure side to a few ounces.

They may be set to reduce to two ounces, or any pressure up to one pound. Any pressure desired is instantly accomplished by changing the weight on the lever.

Our improved style of valve makes a perfectly tight joint, thus preventing increase of pressure on low side when the consumption is light or entirely shut off; and, being perfectly balanced, it is not affected by the variations of pressure that may occur on the inlet side.

Made in all sizes up to 24 inches.



Send for our illustrated catalog.

The CHAPLIN-FULTON MANUFACTURING CO.
PITTSBURGH PENNSYLVANIA

THE GAS MACHINERY CO.,
CLEVELAND, OHIO.

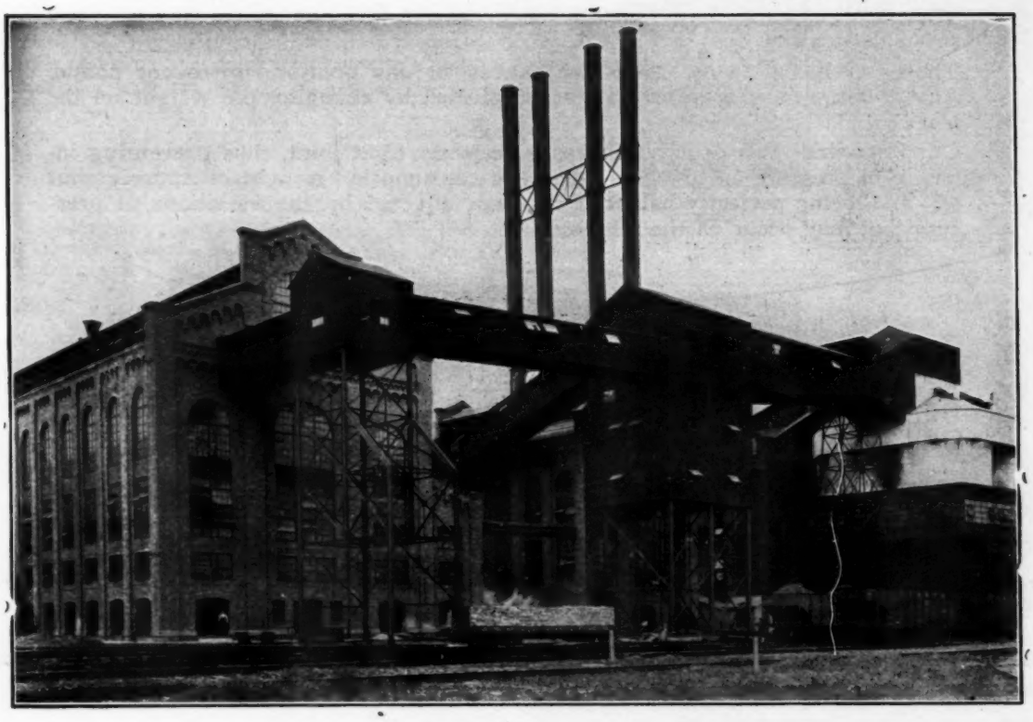
COAL AND WATER GAS APPARATUS,

BENCHES,
BY-PRODUCT GAS OVENS,
PURIFIERS,
AMMONIA CONCENTRATORS,
TAR EXTRACTORS,
VALVES AND CONNECTIONS,
WASHERS,

COMPLETE GAS PLANTS,

BY-PRODUCT AND SPECIAL MACHINERY.

No 787



70,000,000 CUBIC FEET PER DAY

Fuel unloading and handling apparatus for Boiler House and Water Gas Plants, having capacity of seventy million cubic feet per day.

Designed and erected by the Bartlett Hayward Company.

The BARTLETT HAYWARD CO.

Engineers and Founders

BALTIMORE NEW YORK

The Welsbach Line Makes Friends for Gas Heat

What do your customers look for in a gas heater when they come in to buy?

They are probably sold on gas heat already; they know it is quick, clean and always on the job. But what of the actual heater itself? Is the heat it gives the only consideration? Has economy of operation any influence? Or, does appearance figure most?

No matter what the individual needs and preferences of your customers, they can be met most satisfactorily with the Welsbach line.

The points that help you sell Welsbach Radiant Heaters *keep* them sold, and, what is equally important, keep gas heat sold. The superior design and workmanship result in sturdier wearing qualities and greater and more lasting heating efficiency. The pains taken with the construction, materials and positioning of all component parts of a Welsbach Radiant Heater assure absolutely dependable, complaint-free service. Every user of a Welsbach Radiant Heater becomes a booster for gas heating.

When the testing laboratories of gas companies report to their commercial departments that Welsbach Radiant Heaters, for all-around excellence, are superior to any other on the market, it's an endorsement to be proud of. And they're doing it every day!

No. 37 With Andirons
A new fireplace model, with header extending entirely to the top—an added advantage in practical utility and appearance.

No. 37 With Andirons and Wings
Both No. 37 and No. 39 (identical with No. 37 save for two additional glowers) come with or without andirons, wings and extension top.

No. 29 With Andirons
Has exposed copper reflector.

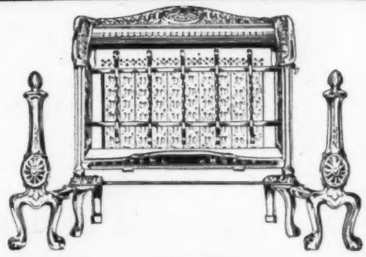
Welsbach Gas Heaters

Their unique method of producing and instantly distributing radiant heat gives to Welsbach Heaters many demonstrable advantages that readily make sales. Perfect service is assured by various exclusive features, each meaning much in added warmth, speed and convenience.

A self-lighter eliminates matches, and, with a header, provides for instant and complete ignition of all glowers. A metal reflector prevents waste and assures instant "pick-up." Perfect combustion is insured by a free flow of secondary air; a screen protecting burner openings from dust and lint; and rust- and corrosion-proof burner caps.

WELSBACH COMPANY GLOUCESTER CITY, N. J.

MEMBER AMERICAN GAS ASSOCIATION



No. 27 With Andirons
Massed glower effect.

Lavino Oxide

The oxide that removes the last trace of H_2S.
The oxide of unsurpassed activity.
The oxide of quick revivification.
The oxide requiring few changes.
The oxide of long life.
The oxide that reduces the cost of purification.

Available as imported or in the form of Sponge ready for use.

WE SOLICIT YOUR INQUIRIES

Oxide Department

E. J. Lavino and Company

BULLITT BLDG. PHILADELPHIA, PA.

METERS

For Measuring
Production and Distribution
of

Oil — Gasoline — Gas
and Other Fluids

Also manufacturers of meters for water, gasoline, oil, air and other fluids

PITTSBURGH METER COMPANY
General Office and Works:
7800 Susquehanna Street, Pittsburgh, Pa.

SALES OFFICES
New York—50 Church St. Columbia, S.C.—1433 Main St.
Chicago—5 So. Wabash Ave. Seattle—4038 Arcade Building
Kansas City—Mutual Bldg. Los Angeles—Union Bk. Bldg.

CRUSE-KEMPER CO.

Gas Holders - Tanks - Purifiers

Steel Plate Work

C-K CO

COMPANY MEMBER OF AMERICAN GAS ASSOCIATION

AMBLER, PA.

THE WESTMORELAND COAL COMPANY

CHARTERED 1854

Mines situated on the Pennsylvania and the Baltimore and Ohio Railroads, in Westmoreland County, Pa.

POINTS OF SHIPMENT: PHILADELPHIA, BALTIMORE, SOUTH AMBOY, N. J.

Since the commencement of operations by this Company, its well-known Coal has been largely used by the Gas Companies of New England and the Middle States, and its character is established as having no superior in gas-giving qualities, and in freedom from sulphur and other impurities.

PRINCIPAL OFFICE, 224 SOUTH THIRD STREET, PHILADELPHIA, PA.

Beautiful but Dumb

NYE THE DIE MAN
Pipe Die Maker to
Those Who Know

They knock the girl who is beautiful but dumb, but she isn't the girl I am sorry for.

The real tragedy of life is the girl who is homely but dumb.

If a girl hasn't any figure, she ought at least to be able to add them up.

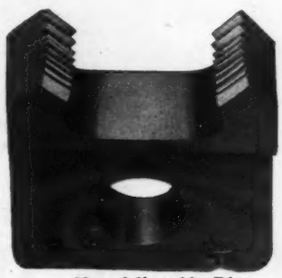
The Nye Die isn't as highly polished as a saxophone, but it lives a nobler life.

And it certainly makes sweeter music for a plumber or steamfitter.

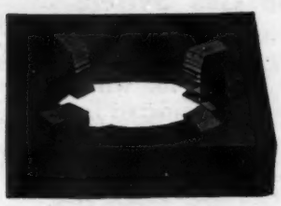
The Nye Die is better than beautiful but dumb—it is beautiful but useful.

There are many reasons why there are many occasions when it is so far superior you wonder why men bother with any other.

HARRY G. NYE.



Nye Adjustable Die



Nye Solid Die

The NYE Tool & Machine Works

Nothing but Tools — None but the Best

108-128 N. Jefferson St. **CHICAGO, ILL.**

McWANE PRECALKED JOINT PIPE CAST IRON

Users term it the best gas joint they have yet found. It comes as part of the pipe.

They speak, too, of their savings in time, labor, and money through laying it.

The list of our customers is in itself an evidence of the merit of this pipe. Ask us for booklet GJ, names of users near you, prices.

McWANE CAST IRON PIPE COMPANY

General Offices
Birmingham

819 Bankers Trust Bldg.
Philadelphia

422 Central Bldg.
Los Angeles

1301 Magnolia Bldg
Dallas

LAMBERT METERS

Made right—of finest material, by master craftsmen. They stay right. After years of service they are still right.

LAMBERT METER CO.

Bush Terminal Building No. 4
Thirty-Fifth Street
BROOKLYN, N. Y.

Made According to A. G. A. Specifications and U. G. I.

ACME GAS COCKS

For Ranges, Hot Plates and Other Gas Appliances

ACME BRASS WORKS

8211 Collins Ave. and Belt Line R. R.
DETROIT MICHIGAN

STACEY BROS.
GAS CONSTRUCTION CO.

Engineers and Builders of

GAS HOLDERS
and
GAS PLANTS

CINCINNATI . . . OHIO

THE KEMP
Automatic Gas System

The Kemp System increases the uses for gas, applying it efficiently and economically for purposes for which the use of gas has been considered impracticable.

THE C.M. KEMP MFG. CO.
BALTIMORE, MD. 405-415 E OLIVER STREET

HYTEMPITE
(Reg. U. S. Pat. Off.)

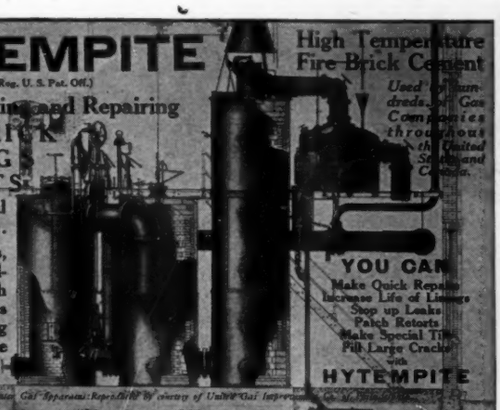
For Bonding and Repairing
FIRE BRICK LININGS RETORTS

Making Special TILE, etc.

It Air-sets, has great binding strength as well as heat resisting and adhesive qualities.

High Temperature Fire-Brick Cement

Used by hundreds of Gas Companies throughout the United States and Canada.



YOU CAN
Make Quick Repairs
Increase Life of Linings
Stop up Leaks
Patch Retorts
Make Special Tile
Fill Large Cracks
with
HYTEMPITE

QUIGLEY FURNACE SPECIALTIES CO., Inc., 26 Cortlandt Street NEW YORK

STOKERS

Builders of Mechanical Stokers for 36 years

Sales and Service Offices in All Principal Cities

Address Nearest Office

Westinghouse Electric & Mfg. Co.
So. Philadelphia Works, Philadelphia, Pa.

W
WESTINGHOUSE ELECTRIC

Westinghouse

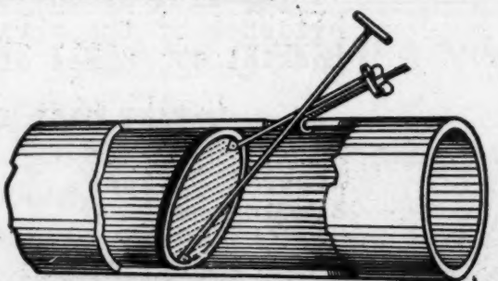
GIVE THE HOUSEHOLDER WHAT HE WANTS!

The householder wants **Heat**, without the drudgery of coal hauling, ash removing and constant attendance on the furnace. He wants plenty of warmth at least cost. You can give him **both** by selling him a

FRANKLIN QUICK-REMOVABLE GAS BURNER

With this device he can equip his hot-water or hot-air furnace, or steam boiler, and use either one, or the gas burner alone, or both.
There's a good profit in it for you. Write for details.

FRANKLIN GAS BURNER MFG. CO.,
Vine & Mitchell Sts. Cincinnati, Ohio

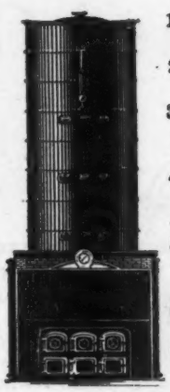


GOODMAN STOPPER
STREET DEPARTMENT SPECIALTIES
SAFETY GAS MAIN STOPPER COMPANY

523 Atlantic Ave. Brooklyn, N. Y.

The Wickes Vertical Water Tube Boiler

Every Day Efficient Because:



Steel Cased Setting Increases Efficiency

1. Kept clean of dust and soot by gravity to the utmost.
2. Kept clean of water impurity by gravity to the utmost.
3. Large accessible mud drum to receive and retain water impurity.
4. Man stands erect cleaning boiler. Washed in five hours, or turbined in ten hours.
5. Straight tubes obtainable anywhere that may be inspected from end to end.
6. Steel casing reduces air excess to minimum.
7. Gas passages are long, of small cross section, and free from turns.
8. Delivers absolutely dry steam.

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The Wickes Boiler Company

SAGINAW, MICH.

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FLANGE END VALVES

We can furnish Valves for working pressures up to 1200 lbs. per sq. in.

Send for Circular 5

The LUDLOW VALVE MANUFACTURING COMPANY

TROY, N. Y.

New York 62 Gold Street | Boston Oliver Building | Philadelphia Harrison Building
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IRON OXIDE

A prepared iron boring oxide whose physical properties make it purify at least cost.

Let us solve your purifying troubles

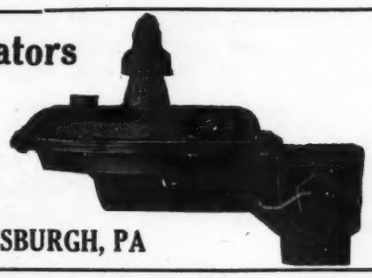
GAS PURIFYING MATERIALS CO., Foot of Halsey St., Long Island City, New York

"EMCO" Meters and Regulators

For Artificial and Natural Gas

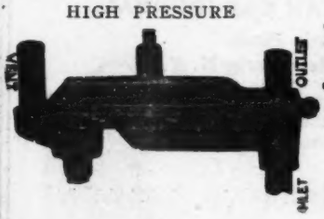
Meters for Low and High Pressure.
Proportional Meters, Provers, Gauges and Burners.
Regulators of all kinds.

Write for Catalog and Prices.



EQUITABLE METER CO. 432-34-36 First Avenue **PITTSBURGH, PA**

HIGH PRESSURE



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San Francisco

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ARTIFICIAL GAS GOVERNORS
and
NATURAL GAS REGULATORS

For All Kinds of Pressure Reduction

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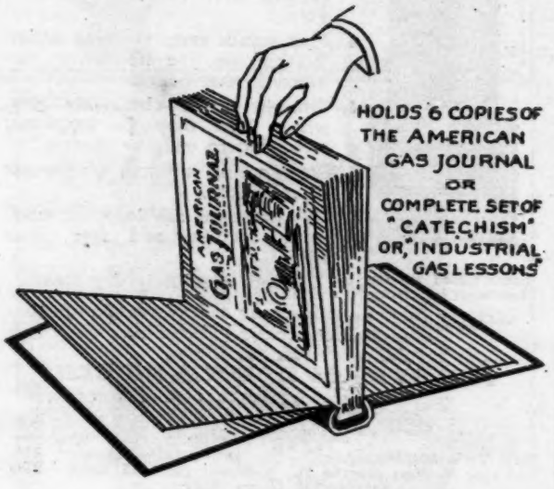
Reynold's Gas Regulator Co.

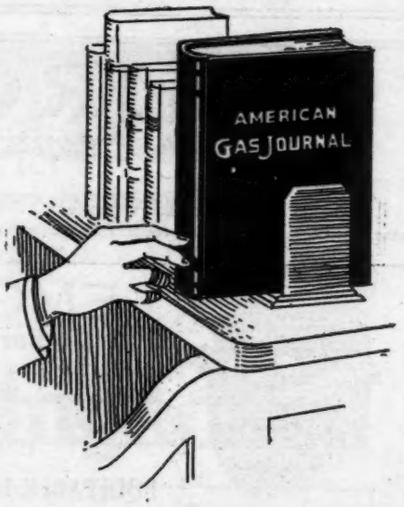
SERVICE GOVERNORS

"OLD STYLE" (Without Seal)

Main Office and Works
ANDERSON, INDIANA

A Binder for Your "CATECHISM"





Since the American Gas Journal commenced the republishing of that standard book, "Catechism of Central Station Gas Engineering," and "Industrial Gas Lessons," beginning January 5th, 1924, we have had frequent requests for an appropriate binder to hold them.

Recently we have been able to secure a spring-back binder, heavy covers, bound in leatherette, size 9½"x 12½". There are no screw plugs to take out or punching of holes in sheets — just spring back the covers and insert new sheets and they are securely held in place.

It will hold complete "Catechism," or complete "Industrial Gas Lesson" series; or can be used as a current file for six complete copies of American Gas Journal.

This binder usually retails at $2.50 in the average stationery store. It is one that will look exceedingly well on the shelves of any library, and is offered to our subscribers at cost, $1.25 each, postpaid.

We can start making deliveries about December 15th.

Make checks or money orders payable to American Gas Light Journal, Inc.

AMERICAN GAS JOURNAL,
53 Park Place,
New York, N. Y.

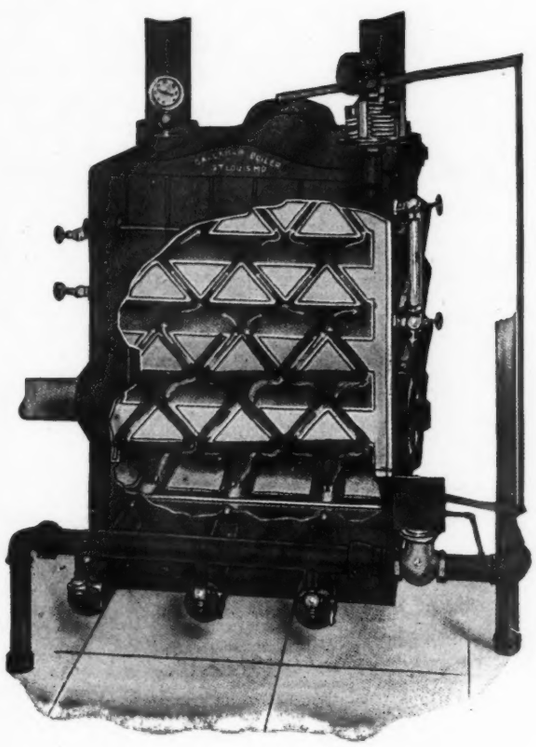
Enter my order for binder which you offered at cost price, $1.25. Enclosed is remittance to cover.

Name .....

Address .....

Position .....

Other Gas Companies Are Doing It!



Send for our booklet and terms and learn how Gallaher Gas-Fired Boilers will increase both Volume Sendout and Profit.

TO educate the masses to the convenience, cleanliness, economy, wastelessness, safety and all the other virtues of house heating by gas, will take time and patience; but if the start is not made the goal will never be reached.

Yet there are some gas companies who have approached the house-heating-by-gas problem in an earnest, systematic manner; notably, The Laclede Gas Light Co. of St. Louis, who have surmounted all of the difficulties and whose efforts have been entirely successful.

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Laclede Gas Building, St. Louis, Mo.

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GAS INDUSTRY
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All our products in illumination ware are the selection of men who have studied the gas lighting business for over half a century.

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Emaus Pipe Foundry

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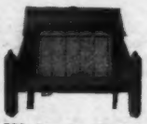

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The J. G. White Management Corporation, Operating Managers

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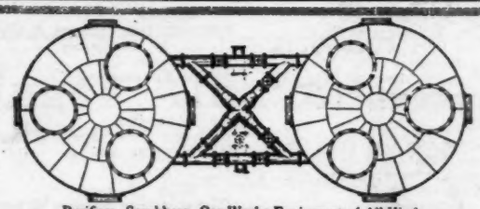
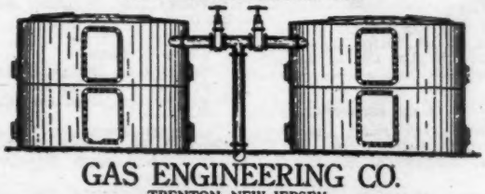
Our More Than 40 Years' Experience Is at Your Service

American Gas Furnace Co.
Elizabeth, N. J.



Purifiers, Scrubbers, Gas Works Equipment of All Kinds
Welded and Riveted Plate Metal Work



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TRENTON, NEW JERSEY

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GAS PURIFYING MATERIAL
Sun Oxide of Iron

Prepared Mineral Sponge

Mineral Sponge (Lime Base)

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YOU'RE GOING TO USE
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Absolutely protects gas pipes against electrolytic corrosion. Keep a supply on hand for emergencies in repairing breaks in mains and services.

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Two and One-half Million
IMPERIAL GAS IRONS

Are bringing comfort and satisfaction to the housewives of America and a handsome profit to the Gas Companies selling them. Write for our extraordinary merchandising plans and get your share of the profits.

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Buyers Reference Index

See page 33 for advertisements of these products

AMMONIA CONCENTRATORS
Michigan Ammonia Works

AMMONIA STILLS
Unger, John S.

ANNEALING MACHINES
Rotary
American Gas Furnace Co.

BAFFLES
Quigley Furnace Specialties Co.

BAGS
Gas
Edward A. Behringer Co.
Safety Gas Main Stopper Co.
See also Stoppers.

BENCHES
Complete
Bartlett-Hayward Co.
Gas Machinery Co.
Gardner, James, Jr., Co.
Improved Equipment Co.
Isbell-Porter Co.
Jersey City Refractories Co.
Missouri Firebrick Co.
Parker-Russell Mining & Manufacturing Co.
Russell Engineering Co.
Stacey Brothers Gas Constr. Co.
Steere Engineering Co.
West Gas Improvement Co.

BENZOL
Bartlett-Hayward Co.
Gas Machinery Co.

BLOWERS
Pressure
American Gas Furnace Co.
Connersville Blower Co., The
Roots, P. H. & F. M.

BOILER GRAPHITE
Dixon Crucible Co., Joseph

BOILERS
New York Engineering Co.

BOOSTERS
American Gas Furnace Co.
Connersville Blower Co., The

BURNERS (Industrial)
Surface Combustion Co.
Fuel
American Gas Furnace Co.
Connelly Iron Sponge & Gov. Co.
Franklin Gas Burner Mfg. Co.

BY-PRODUCT PLANTS
Bartlett-Hayward Co.
Gas Machinery Co.
Riter-Conley Co.
Steere Engineering Co.

CALORIMETERS
American Meter Co., Inc.

CEMENTS
Jos. Dixon Crucible Co.
Gardner, James, Jr., Co.
Gerould, C. L.
Improved Equipment Co.
Jersey City Refractories Co.
Parker-Russell Min. & Mfg. Co.
Quigley Furnace Specialties Co.

CHARGING MACHINERY
Bartlett-Hayward Co.
Gas Machinery Co.
Hunt, C. W. Co.
Improved Equipment Co.
Isbell-Porter Co.
Parker-Russell Min. & Mfg. Co.
Stacey Manufacturing Co., The
Stacey Bros. Gas Construction Co.

COCKS
Acme Brass Works
Claus Automatic Gas Cock Co.

COALS
Westmoreland Coal Co.

COAL GAS APPARATUS
Bartlett-Hayward Co.
Gas Machinery Co.
Improved Equipment Co.
Isbell-Porter Co.
New York Engineering Co.
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.
Stacey Bros. Gas Constr. Co.
Stacey Manufacturing Co., The
U. G. I. Contracting Co.
West Gas Improvement Co.

COAL AND COKE HANDLING MACHINERY
Bartlett-Hayward Co.
Isbell-Porter Co.
Hunt Co., C. W.
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.

COKE CRUSHERS
Bartlett-Hayward Co.
Keller, C. M.

COMPUTERS
United Gas Improvement Co.
Low Pressure
Cox—American Gas Journal
Fox—American Gas Journal
High Pressure
Cox—American Gas Journal

CONDENSERS
See Purifiers

CONVEYORS
Bartlett-Hayward Co.
Gas Machinery Co.
Hunt, C. W., Co.
Isbell-Porter Co.
Stacey Bros. Gas Constr. Co.
Stacey Manufacturing Co., The

CONCENTRATORS—AMMONIA
Michigan Ammonia Works

DERRICKS—PIPE
Safety Gas Main Stopper Co.

DIES
Nye Tool & Machine Works

DISCHARGING MACHINERY
Bartlett-Hayward Co.
Hunt, C. W. Mfg. Co.
Improved Equipment Co.
Isbell-Porter Co.

DRIP PUMP BOX
Keller, C. M.

ELEVATORS
Ridgway, Craig, & Sons

ENGINEERS
Combustion
Improved Equipment Co.
Parker-Russell Min. & Mfg. Co.
Surface Combustion Co.
Consulting
Allison, Walter A.
Byllesby & Co., H. M.
Freese, Fred W.
Improved Equipment Co.
Ludlum Engineering Co.
Waring, George H.
Contracting
Barrett, William E.
Bartlett-Hayward Co.
Byllesby & Co., H. M.
Cruse-Kemper Co.
Gas Machinery Co.
Improved Equipment Co.
Isbell-Porter Co.
New York Engineering Co.
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.
Stacey Bros., Gas Constr. Co.
Stacey Manufacturing Co., The
Steere Engineering Co.
U. G. I. Contracting Co.

EXHAUSTERS
Connersville Blower Co., The
Gas Machinery Co.
Isbell-Porter Co.
P. H. & F. M. Roots Co.

FIREBRICK—CHECKER BRICK
Gas Machinery Co.
Gardner, James, Jr., Co.
Improved Equipment Co.
Jersey City Refractories Co.
The Jersey City Refractories Co.
Missouri Firebrick Co.
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co

FITTINGS
Claus Automatic Gas Cock Co.
Donaldson Iron Co.
New York Engineering Co.
Steere Engineering Co.
U. G. I. Contracting Co.

FIXTURES
General Gas Light Co.
Gleason, E. P., Mfg. Co.
Welsbach St. Lt. Co. of Amer.
Welsbach Co.

FURNACES (Case Hardening)
American Gas Furnace Co.
Improved Equipment Co.
Surface Combustion Co.

FURNACE BURNERS
Franklin Gas Burner Mfg. Co.

GAS ANALYSIS APPARATUS
U. G. I. Contracting Co.

GAS MASKS
Edward A. Behringer Co.
Safety Gas Main Stopper Co.

GAS PLANTS, COMPLETE
Bartlett-Hayward Co.
Gas Machinery Co.
Improved Equipment Co.
Isbell-Porter Co.
Parker-Russell Min. & Mfg. Co.
Riter-Conley Co.
Russell Engineering Co.
Stacey Manufacturing Co., The
Stacey Bros. Gas Constr. Co.
U. G. I. Contracting Co.
West Gas Improvement Co.

GAS-TESTING APPARATUS
American Meter Co., Inc.
Equitable Meter Co.
Lambert Meter Co.
Superior Meter Co.
Sprague Meter Co

GAUGES
Pressure-Recording
American Meter Co., Inc.
Connelly Iron Sponge & Governor Co.
Helme & McIlhenny
Lambert Meter Co.
McDonald & Co., D.
Pittsburgh Meter Co.
Precision Thermometer & Instrument Co.
Superior Meter Co.
Sprague Meter Co.
U. G. I. Contracting Co.

GLASSWARE
Globes, Shades and Bowls
Gleason, E. P., Mfg. Co.
Welsbach Co.

GLOBES, GAS
Gleason, E. P., Mfg. Co.
Welsbach Co.

GOVERNORS
American Meter Co., Inc.
Chaplin-Fulton Mfg. Co.
Connelly Iron Sponge & Gov. Co.
Equitable Meter Co.
Reynolds Gas Regulator Co.
Automatic
Connelly Iron Sponge & Gov. Co.
Equitable Meter Co.
Steere Engineering Co.
Coke Oven
Connelly Iron Sponge & Gov. Co.
Equitable Meter Co.
Gas Machinery Co.
Steere Engineering Co.
District
Connelly Iron Sponge & Gov. Co.
Helme & McIlhenny
Isbell-Porter Co.
Steere Engineering Co.
Exhauster
Connelly Iron Sponge & Gov. Co.
Isbell-Porter Co.
High Pressure
Connelly Iron Sponge & Gov. Co.
Chaplin-Fulton Mfg. Co.
Reynolds Gas Regulator Co.
Sprague Meter Co.
Low Pressure
Connelly Iron Sponge & Gov. Co.
Chaplin-Fulton Mfg. Co.
Reynolds Gas Regulator Co.
Retort House
Connelly Iron Sponge & Gov. Co.
Gas Machinery Co
Isbell-Porter Co.
Steere Engineering Co
Service
Connelly Iron Sponge & Gov. Co.
Chaplin-Fulton Mfg. Co.
Equitable Meter Co.
Gas Machinery Co.
Sprague Meter Co.
Station
Connelly Iron Sponge & Gov. Co.
Equitable Meter Co.
Gas Machinery Co.
Helme & McIlhenny
Reynolds Gas Regulator Co.
Station Automatic
Connelly Iron Sponge & Gov. Co.
Gas Machinery Co.

HEATERS (WATER)
Pittsburg Water Heater Co.

HEATERS—ROOM
General Gas Light Co.
Radiant Heat Corpn. of Amer.
Standard Gas Equipment Corp'n (Vulcan Div.).
Welsbach Company

HEATING MACHINES
American Gas Furnace Co

HOLDERS
Bartlett-Hayward Co.
Cruse-Kemper Co.
Riter-Conley Co.
Stacey Bros. Gas Constr. Co.
Stacey Manufacturing Co., The

HOUSE HEATING BURNERS
Franklin Gas Burner Mfg. Co.

HOPPERS—COAL & COKE
N. Y. Engineering Co.

HYDROGEN GAS APPARA
Improved Equipment Co

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SILICA or FIRE CLAY BENCHES
JAMES GARDNER JR. CO.
Ebensburg, Cambria County, Pa.

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CONSULTING ENGINEER
POWERS THEATRE BUILDING
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Make a Superior Concentrate without Salting
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Steel Transmission Towers
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Design, construction, supervision of Gas Plant and Distribution System.
Investigations, Appraisals, Rate Structure.
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STEERE ENGINEERING CO.
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BRADFORD, PENNA., U. S. A.

Russell Engineering Company *St. Louis*
Coal Carbonization Plants, Benches, Repairs, Improvements, Extensions, Apparatus

Buyers' Reference Index

See page 33 for advertisements of these products

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American Gas Furnace Co.
Surface Combustion Co.

INDUSTRIAL GAS MIXERS
C. M. Kemp Mfg. Co.

INSTRUMENTS
Recording
American Meter Co.
Pittsburgh Meter Co.
Precision Ther. & Inst. Co.

IRONS—GAS
Benson Mfg. Co.
General Specialty Co.

INSULATION (Heat)
Quigley Furnace Specialties Co.

IRON SPONGE
Connelly Iron Sponge & Gov. Co.

JOINTS—PACKING
Connelly Iron Sponge & Gov. Co.

LAMPS
General Gas Light Co.
Gleason, E. P., Mfg. Co.
Welsbach Co.
Welsbach Street Lighting Co.

LAMP POSTS
General Gas Light Co.
U. S. Cast Iron Pipe & Fdry. Co.
Welsbach Street Lighting Co.

MANTLES
General Gas Light Co.
Gleason, E. P., Mfg. Co.
Welsbach Co.
Welsbach St. Ltg. Co. of Amer.

MASKS—GAS
Edward A. Behringer Co.
Safety Gas Main Stopper Co.

METERS
Air
Connersville Blower Co.
Equitable Meter Co.
Gas Machinery Co.
Lambert Meter Co.
Pittsburgh Meter Co.
P. H. & F. M. Roots Co.
Superior Meter Co.
Artificial Gas
Connersville Blower Co.
Griffin & Co., John J.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
Pittsburgh Meter Co.
P. H. & F. M. Roots Co.
Sprague Meter Co.
Superior Meter Co.
Dry
Cleveland Gas Meter Co.
Natural Gas
Cleveland Gas Meter Co.
Connersville Blower Co.
Equitable Meter Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
Metric Metal Works
P. H. & F. M. Roots Co.
Pittsburgh Meter Co.
Sprague Meter Co.
Superior Meter Co.
Prepayment
American Meter Co., Inc.
Cleveland Gas Meter Co.
Griffin & Co., John J.
Helme & McIlhenny
Maryland Meter Works
McDonald & Co., D.
Sprague Meter Co.
Tufts, Nathaniel, Meter Co.
Station
American Meter Co., Inc.
Connersville Blower Co.
Griffin & Co., John J.
Helme & McIlhenny
Maryland Meters Works
McDonald & Co.
P. H. & F. M. Roots Co.
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Lambert Meter Co.
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METER CONNECTIONS
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Lattimer-Stevens Co.
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OVENS—COKE AND GAS
Gas Machinery Co.
Improved Equipment Co.
Parker-Russell Min. & Mfg. Co.
Russell Engineering Co.
Stacey Bros. Gas Constr. Co.

OXIDE
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Alpha Lux Co.
Am. Min. Prod. & Col. Co., Ltd.
Connelly Iron Sponge & Gov. Co.
Gas Purifying Materials Co.
Iron Hydroxide Co.
Lavino, E. J., & Co.

PAINTS
Dixon Crucible Co., Jos.

PHOTOMETERS
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Cast Iron Pipe Publicity Bureau.
Donaldson Iron Co.
Glamorgan Pipe & Foundry Co.
James B. Clow & Sons.
Lynchburg Foundry Co.
McWane Cast Iron Pipe Co.
National Cast Iron Pipe Co.
U. S. Cast Iron Pipe & Fdry. Co.

PIPE CUTTERS
Strickler, W. W. & Bros.

PLATES
Floor
U. S. Cast Iron Pipe & Fdry. Co.
Metal
Bartlett-Hayward Co.
Cruse-Kemper Co.
Stacey Bros. Gas Construction Co.
Stacey Mfg. Co.

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Safety Gas Main Stopper Co.

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Gas Machinery Co.
Steere Engineering Co.

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Equitable Meter Co.
Helme & McIlhenny
Lambert Meter Co.
Maryland Meter Works
McDonald & Co., D.
Pittsburgh Meter Co.
Sprague Meter Co.
Superior Meter Co.

PUMPS
Drip—Tar—Oil
American Meter Co., Inc.
Connersville Blower Co., The

PUMPS—TRENCH

PURIFIERS
Bartlett-Hayward Co.
Gas Machinery Co.
Isbell-Porter Co.
New York Engineering Co
Parker-Russell Min. & Mfg. Co.
Riter-Conley Co.
Stacey Bros. Gas Constr. Co.
Stacey Manufacturing Co., The
Steere Engineering Co.
U. G. I. Contracting Co.

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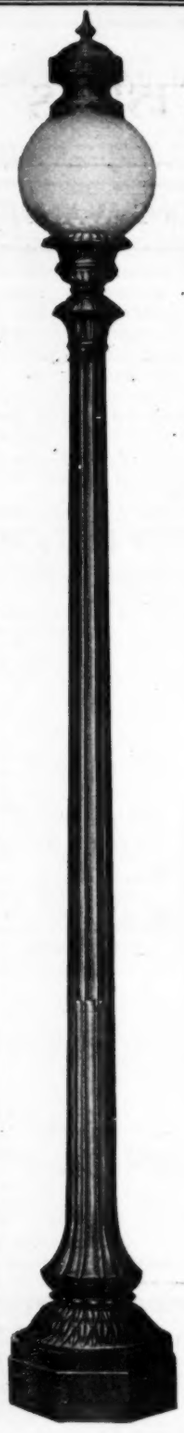

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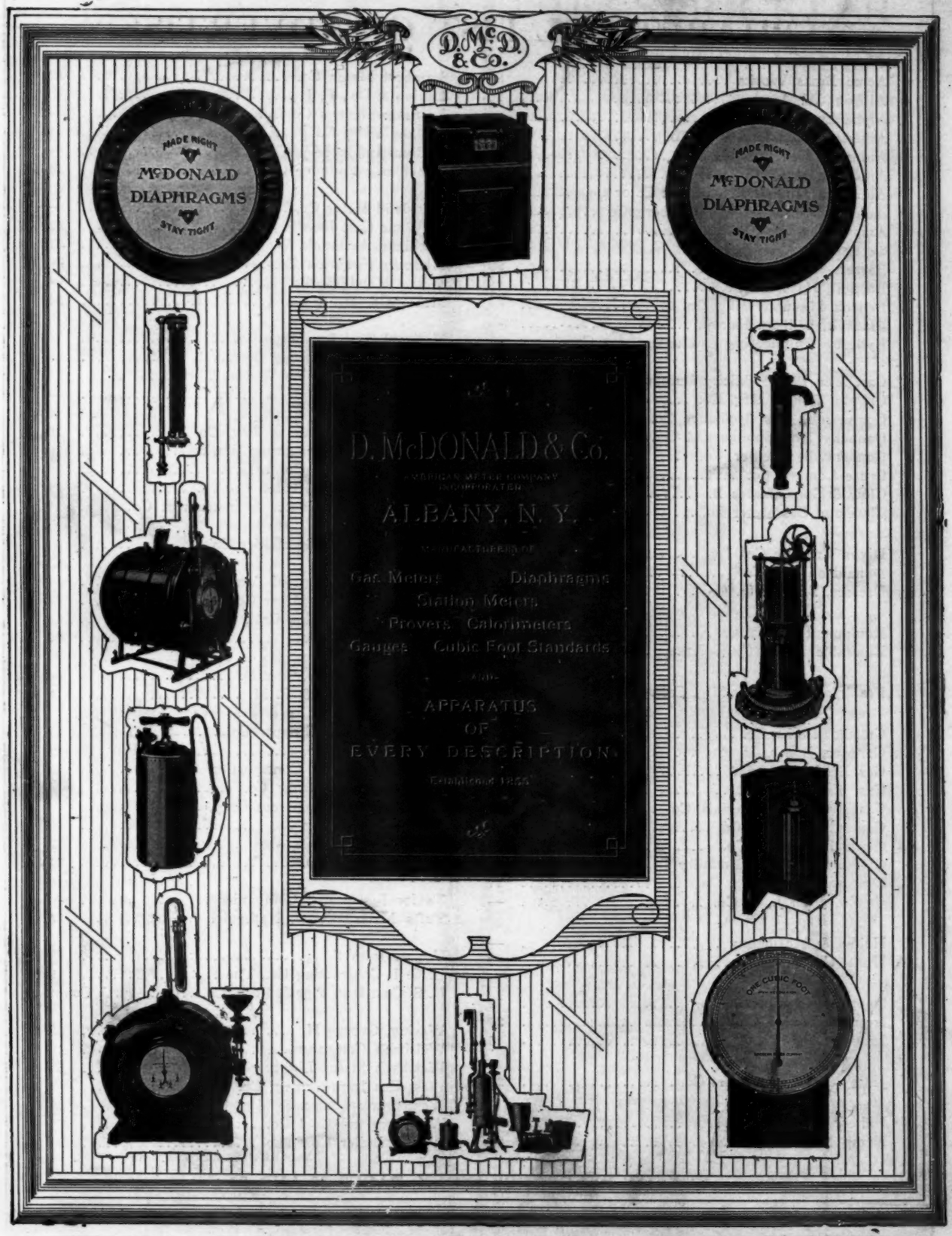
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